A COMPENDIUM

OF

CATTLE MEDICINE;

OR

PRACTICAL OBSERVATIONS

ON THE

DISORDERS OF CATTLE

AND THE OTHER DOMESTIC ANIMALS, EXCEPT THE HORSE.

WITH

A SERIES OF ESSAYS

ON THE

STRUCTURE, ECONOMY, AND DISEASES

OF

HORNED CATTLE AND SHEEP,

As communicated to the Bath and West of England Society.

2470

BY JAMES WHITE,

Late Veterinary Surgeon of the First or Royal Dragoons.

BEING A FOURTH VOLUME

Of his "Treatise on Veterinary Medicine."

VENIENTI OCCURRITE MORBO.

Learn to prevent the Diseases of Animals by proper Management.

FIFTH EDITION.

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PREFACE

TO

THE THIRD EDITION.

My imperfect attempt to do something for the improvement of cattle medicine met with so favourable a reception, that I have considered it as a duty I owed to an indulgent public, to continue my attention to the subject, and devote to it a considerable portion of my time. To accomplish the important duty I had undertaken, of improving the state of cattle medicine, I have been residing for nearly five years in a situation where many large dairies are kept, and where there are kennels to which dead cattle are often brought. This has afforded me ample opportunity of attending to the diseases of milch cows in particular, and of examining their bodies after death. I have been in a situation, also, where many flocks of sheep are kept, and have had opportunities of seeing a great deal of their disorders. To the disorders of working oxen, and such as are fattening, I have

also paid attention, and hope that the observations I shall make on those subjects will be found in some measure new, and altogether useful. I have likewise offered some remarks on the diseases of swine,—a subject that has hitherto been much neglected, though one of considerable moment. The disorders of dogs may be deemed of minor importance, but great loss is often sustained, especially in kennels, by one to which these animals are subject, named distemper: I have, therefore, pointed out a method of treating it, which, if employed early, will, I trust, always be found effectual. Those of cats may be thought not worth notice; but as the animal is useful in a certain degree, its disorders should be attended to. The book will conclude with a consideration of the diseases of these animals, and those of poultry. I have endeavoured to compress the subject as much as possible, and hope that nothing superfluous will be observed; but conciseness, however desirable, is not always compatible with perspicuity, or a clear understanding of the subject. If, therefore, I have dwelt a little upon some things which appeared of more consequence than others, the reason, I trust, will be obvious. The milch cow, for example, is of far greater importance to society, than any other animal, except the horse, and the structure and economy

of her digestive organs are peculiarly worthy of attention. The essays which form the appendix, will be found, I hope, both useful and amusing, by all those who are desirous of improving the treatment of cattle, and ameliorating their condition. It is the same with cattle as in horses, as I have remarked in the Preface of my second volume, namely, it is for the interest of all proprietors to treat them with humanity.

A righteous man regardeth the life of his beast.—Prov. xii. 10.

A man of kindness to his beast is kind,
But brutal actions show a brutal mind.
Remember he who made thee made the brute,
Who gave thee speech and reason formed him mute;
He can't complain; but God's omniscient eye
Beholds thy cruelty—HE hears his cry;
He was design'd thy servant and thy drudge;
But know that his creator is thy Judge.

Bath Herald of March 31, 1821.

PREFACE

TO

THE FOURTH EDITION.

THE very favourable reception which the last edition has met with, determined me to use every exertion for its improvement; and I trust the reader will find that I have not been wholly unsuccessful. I have prefixed to this edition some observations on the dairy, which I hope will be read with interest; and I have annexed to it a translation of a French pamphlet on the method of managing Milch Cows, which I think will be found useful. It was written by two French Veterinary Professors of great eminence, and printed and published by the French Government, to be distributed to the dairy farmers in Paris and its vicinity. It has passed through several editions, and been translated into several languages. I thought, therefore, that an English translation of it would not be unacceptable to the purchasers of this little volume.

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OBSERVATIONS

ON

THE DAIRY.

THE first object in the establishment of a dairy is to procure such cows as are most fit for the purpose; and though there are various opinions as to the breed or sort that is most likely to answer, yet I think it will appear, after a careful inquiry into the subject, that this is a point which can be found out only by experience. That there are good and bad of all sorts is a point, I think, that will be conceded by all practical dairy farmers; my advice therefore is to choose such cows as are of a tolerable size, and of a form and disposition well adapted for fattening,—a use they must be put to should they be found unprofitable as milch cows.* If the

* It has been asked at what age is it most desirable to purchase a cow; I should think they should not exceed five, nor be younger than three years. My opinion is, that they are often, perhaps generally, put to the bull too early; that is, they are brought into the dairy farm long before they arrive at maturity. This must certainly tend to weaken the constitution; and though the effect of premature breeding may not be soon observed, it may be

dairy farm is in a cold, exposed situation, I would advise a choice of such cows as are already inured to the climate, and the keeping up of the stock afterwards by breeding; but if the farm is in a more southern or sheltered situation, and consequently the pasture more forward and abundant, great caution will be found necessary in bringing stock from a colder climate, and less productive situation, into such comparatively luxuriant pastures. They should be at first put into the barest fields, and in the coldest situations; and if this precaution be duly attended to, the change of soil and climate will never be productive of mischief. But a sufficient time must always be allowed to enable the constitution to accommodate itself to the change. Writers on rural economy have generally divided the subject of the dairy in two parts, viz. the butter and the cheese dairy; and there are those among them who have endeavoured to make it appear that it is possible for the dairy farmer to

discovered in the progeny; and whoever persists in the system, if he clearly investigates the matter, will find in the end, I suspect, that it is far from profitable. It is generally thought that a cow is in perfection when five years old, therefore, I think, that is the latest period at which she should be purchased.

I think upon the whole that the farmer will find it most profitable to breed his own stock; and should he find this plan not to answer his purpose, it will be advisable to change his bull, for it is generally thought that the goodness of calves depends more upon the male than the female.

excel in both these processes; a position which appears to me very questionable; not from any theoretical reasoning upon the subject, but from the plain matter of fact, that it is an object I have never yet seen accomplished. During the time I resided at Exeter, I found the butter excellent, but the cheese was the very worst I ever met with. Since I have resided in Somersetshire I have found the cheese excellent, and the butter almost uniformly indifferent or bad. In speaking of the division that has been made in this subject by the various authors who have contributed their labours towards its improvement, I should have remarked that besides the butter and cheese dairy, there is still another head under which it may be considered, and that is the milk dairy; for in the vicinity of large towns the demand for milk is so considerable, and the price so high, that the milk dairy alone might be found perhaps, in such situations, more profitable than either of the other two branches. An excellent dairy of this kind has been established by Mr. Harley of Glasgow, whose cow-house, it is said, is an object of curiosity to all who visit that city. The following account of Mr. Harley's dairy I shall take the liberty of transcribing from a useful little work lately published, entitled, "Practical Economy," and it is but justice to the author to observe that this little volume contains a great deal of useful and interesting information upon every branch of

domestic economy. "When we saw Mr. Harley's cow establishment," he says, "it contained 96 inhabitants, each of which was confined to a post by a chain across her neck, of sufficient length to allow her, by means of a sliding ring, to lie down when she pleased. The cows stood in pairs, one before another, on each side of the cow-house, leaving a space of sufficient width for the attendants to pass backwards and forwards between them. Each pair has a grating before them, and the hay for the whole party is cut by means of a small steam-engine. The temperature is regulated with great exactness, the whole premises kept in the most delicate state of cleanliness, and the cows themselves regularly curried and rubbed down, which supplies to them the place of exercise, as they never go out except at a given period after the birth of their first calf, when they are always sold, not being retained by Mr. Harley long enough to have a second; it will therefore be easily imagined that the quality of the milk must be as *desirable* to the purchaser as the *quantity* of it must be *profitable* to the proprietor.*

"The milk is all sold in Glasgow; and to prevent its being adulterated by the people who take it out, the barrels which contain it are covered

* There must, I think, be some mistake in this statement: for though the milk after the first calving is generally, perhaps always, richer than at any period afterwards, yet I believe the quantity is generally, if not always, less.

by lids, which have padlocks on them, and there is to each a lock-cock, by which the milk is drawn out. A large stock of pigs are also kept on the milk of this establishment, and 20 roasters are selected from them every Wednesday, and sold at half a guinea each. By adopting the cleanliness and judiciousness of such of these regulations as may be practicable on a small scale, a private family may keep a cow with less trouble and expense than are attendant on keeping a horse. Let it be kept in remembrance that the cows are profitable in all respects, not only in their present produce, but in their rearing calves for agricultural and dairy purposes, and in fetching nearly their first cost, when age requires they should be fattened for the market. In a moderate establishment where several cows are kept, it will always be found that, after serving the family, the overplus cheese and butter will always pay the expense of keep, and go towards paying the first cost; so as to make the fattening of the cattle, when no longer fit for the dairy, an object of actual profit. This need not be doubted, when it is known that milch cows well housed will give nine gallons of milk per day for some months; and with care and judicious feeding will not fall much below that quantity for some time longer.*

* This account of the average produce of a cow will be found, I fear, over-rated. It is remarked in Rees's Cyclopædia, under the article Dairy, "that the average quantity of milk afforded by cows is very different, in different

Even the calves form an object in the scale of saving. If thought necessary or expedient to

circumstances, depending materially on pastures, season, and the mode of winter keeping; but in the principal cheese districts, from eight to twelve quarts per day is the usual proportion, though many cows will give twice those quantities at a meal, for short periods. But when cows give more than the first of these quantities at a meal, it is remarked that they either go off their milk much sooner, or else their milk has less richness in it than that of others which do not give so large a quantity. The most accurate method of determining the produce, is to weigh the quantity of butter the cow is capable of producing in a given time. In the Lincolnshire Agricultural Report it is stated, that 18 quarts of milk are required to make one pound of butter where the hand churn is employed, and 15 quarts with the horse churn. But in the accurate trials of Mr. J. C. Curwen, where oil cake in small proportion was made use of for feeding the cows, and the pendulum churn, constructed by Mr. M'Dougall, employed, eight wine quarts of the strippings, and nine quarts and a half of a mixture of the whole milk, were found to give a pound of butter. To make cows give abundance of milk, and of good quality, they must at all times be well supplied with good food; and it appears to me that the grass which springs up spontaneously on rich dry soils is the best. In such situations, there is no danger of a cow gorging herself—a circumstance that often occurs when the artificial pastures or roots are made use of. Dr. Anderson says, that so little attention has been bestowed on this subject, that he does not know of any set of experiments that have ever yet been made, with a view to ascertain the effects of any of the natural grasses, which spring up spontaneously, in our fields in abundance, either on the quantity or quality of the milk of cows; and few that have been attempted, even

take them from the cow at the earliest age, they may be easily taught to drink a mixture of hot

with regard to those plants which have been cultivated by art, as green forage for them; though it is well known that some particular kinds of plants strongly affect the taste and alter the quality of particular products of milk. It is indeed, he says, in all cases almost confidently asserted, that old pastures alone can be made to afford rich butter and cheese. This, however, he knows, from his own repeated experience, to be a popular error, as he has frequently seen much richer butter made by one person from cows that were fed in the house, chiefly with cut clover and rye-grass, than that which was made by others where the cows were fed on very rich old pastures. Mankind, he says, are in general disposed to throw the blame of every failure upon some circumstance that does not reflect on themselves as bad managers. Hence it is, that the grass of a farm is often blamed for the want of richness, in the butter produced upon it; when, if the circumstances were fully investigated, it would be found to be occasioned by the unskilfulness or carelessness of the dairy maid, or want of attention in the choice of proper cows. It has been observed to be of great consequence to the produce of the dairy, that the cows should not drop their calves too early in the season; when that happens they fall off in the quantity of milk in the autumn, when, owing to its superior richness, it is more valuable than at any other time. From the end of March to the end of April is the best time in the more northern districts that a cow can drop in, as she soon gets in condition on the early grass, and yields a greater quantity of milk in the course of the season than those that calve either considerably earlier or later; but in the southern parts of the island it is an advantage to calve much earlier. In Cheshire, the above period is the usual time; only a few cows dropping their

water and oatmeal, in the proportion of a pound of meal to four quarts of water, adding to it about three pints of skimmed milk ; or they may be fed with hay-tea, containing one quart of flax-seed to every gallon."

This, however, must be practised only where the milk, on a careful calculation, thus saved, will cover the expense of the artificial food. Where cows indeed are very prolific, the extra calves must either be killed or fed in this manner. Where they come singly it is not so much an object; but in many instances there are twins, or even more. A more extraordinary instance of fecundity in a cow than the following is not, we believe, upon record :—She produced in July, 1815, five calves; in May, 1816, three ditto; in March, 1817, three ditto ; in May, 1818, two ditto ; and in April, 1819, three

calves in January and February. It is a common practice in this district at the period of the cows calving, for the cow-man, or the master of the dairy himself, to get up two or three times during the night to see that every thing is right. The racks, cribs, or mangers, are kept constantly clean, and great regard is paid to the appetites of the different beasts, in order that the quantity of food may be suitably apportioned; and after this, it is not an unfrequent thing for the master to walk from stall to stall, before he goes to bed, that he may add or diminish the fodder in the manner that may appear necessary. It is considered in Cheshire, that 14 or 15 cows are as many as one dairy-maid can attend to, especially where both butter and cheese are made.

ditto; making together sixteen in the space of four years.

Where amusement, more than actual profit, is the object in the choice of cows, the Alderney breed may be selected, their milk being so rich that their average produce of butter per annum amounts to about 200 lb., or 200 gross weight; but their high price as milch cows, and low price with butchers when unfit for the dairy,* are circumstances that must be taken into the calculation. As far as my experience and observation have gone, I have been led to give a preference to the Durham breed, not only on account of their being good milkers, but as being generally of good size, good tempers, and easily fattened when no longer fit for the dairy. This is the sort which seems to be preferred by those who supply the metropolis with milk.

In the various publications that have appeared relative to the management of milch cows, too much stress seems to have been laid on the quality of the food that should be given them, to the exclusion of a much more important circumstance; that is, the health of the organ which is to digest and assimilate the food. This has been a very common error, and has led to the opinion, that the lactiferous powers of the cow may be increased to a great extent

* As it is necessary in this calculation to consider every circumstance, I think that the comparative value of their hides should not be excluded from it.

merely by supplying the animal with that extra natural nutriment which is so abundantly found in the artificial grasses, and the various roots that are now getting into use. This however is a great mistake: the power of the digestive organs is limited; and if we give the animal such food as exceeds either in quantity or quality the power of the organ which is to assimilate it, we are sure to defeat the object we have in view. It is an observation sanctioned by long experience, in the midland districts, that grounds which have been for a great length of time in a state of pasture, are capable of affording milk which abounds more in the oily principle or that of cream, while those which have been laid down to sward for a shorter period are more productive of milk which has the curd or cheese principle in larger proportion. This observation is, I have no doubt, founded on the best of all foundations, that is, long experience; yet, if the reader will reflect a little, I think he will be inclined to admit that one circumstance has been overlooked in this calculation, and that is the assimilative powers of the animal. An Alderney cow would, in such pastures, especially if sheltered from the cold, afford milk equal to the cream of some cows; but a hardy cow, of the long-horned breed, would afford, from the same pasture, milk that would abound more in the caseous or cheesy principle; such is the difference in the

natural constitutions of cows. Now the former cow, in a newly-formed or artificial pasture, would probably soon become surfeited, and have a bad udder, while the latter would thrive, and afford milk abounding in curd. It is not, therefore, the quality of the food only, but the constitutional powers of the animal, that is to be taken into consideration. Another circumstance has been too little attended to, and that is the effect of climate on those cows of the southern breed. They will not do for bleak and exposed situations; and I am sure that every practical dairy-man will agree with me in recommending, for such situations, cows of a hardy constitution. It has been thought, and some experiments have been published in support of the opinion, that by a judicious use of the artificial grasses, and the saccharine and mucilaginous roots in winter, the produce of milk may be not only increased, but extended to a greater length of time; but a little reflection will show us, that in this, as well as in many other farming concerns, people want to take more out of a thing than it is capable of yielding; they want to kill the goose that has the property of laying golden eggs, in order to get them before the proper time. But in this, as in every other thing of the same kind, they are blind to their own true interest.

The richness of the butter made in the Highlands of Scotland is universally ascribed to the cows feeding upon the sweet and shor pasture

in the remote glens. This, I believe, is really the case; though some writers on the subject, and especially Dr. Anderson, seem to think that it is rather owing to their peculiar method of managing their cows; that is, they allow the calves to suck the first portion of the milk, which is the thinnest, and milk off the remainder for butter and cream. For my own part I cannot help thinking, that the proper management of milch cows is a very plain and simple thing. If we have a sufficient extent of old pastures for them, very little reflection upon the subject is necessary; but if we must have recourse to what is called artificial means, then it is that our skill in these affairs is brought into trial. In the natural pastures there is a great variety of herbage, and the animal is led to rove about in order to select such herbs as are most agreeable to her palate; in doing this she obtains such a degree of exercise and cheerfulness as is conducive to health and a perfect digestion; but when allowed an unlimited quantity of this artificial food, it is a temptation that often proves too powerful: for in animals, as in men, we sometimes find inordinate appetites: and where the means of gratifying them are readily afforded, the consequences are sometimes fatal. It is not sufficiently known that, where there is this inordinate appetite for food, there is at the same time generally a morbid degree of thirst, and that by indulging the one, whichever it may be, we promote the other: in this way horses

especially often load their bowels in an almost incredible degree. I am almost inclined to think, that by a judicious use of mangel wurzel, and other nutritious roots, we may promote and extend the lactiferous services of the cow in a considerable degree; yet we should never lose sight of the important truth, that the stomach, as well as the lactiferous organ itself, or udder, are of limited power, and that the former must not be oppressed with an improper quantity of food, nor the udder with too much blood, however wholesome and nutritious the food may be. If we look to the subject of breeding in this animal, the following question naturally arises. What is the cause of difficult labours in the cow? How is it that the assistance of the cow-doctor is so often required to assist the delivery of the calf? Now the best book I ever read on this subject does nothing more than lay down rules for the method of extracting the calf, according to the deviation that it may have taken from its natural position in the uterus. But my view has always extended farther than this, and I trust ever will do so. I wish to discover the cause of the evil, and if I succeed in this object, the remedy, or rather the mode of prevention, will be found at the same time. I have lately examined the body of a cow that died, I think, from over-feeding:—when she was near the time of calving she was kept in the field and liberally supplied with hay (in winter); she was found dead in the morning, and her death was

attributed to her having fallen into a sort of hollow which was so inconsiderable, that had her stomach been free from the load that was found in it, she could undoubtedly have got up again. I found the rumen, or paunch, weighing nearly 100 pounds, and the poor calf seemed to have been driven up into a corner and suffocated. I am decidedly of opinion, that the cause of the peculiar difficulty in parturition, or rather the frequency of it, in the cow, is owing most commonly to improper feeding: and upon looking over an excellent paper on this subject, in the sixth volume of a French publication, entitled "Instructions and Observations, &c. on Veterinary Subjects," I find myself amply borne out in this matter. Improper feeding will not only render calving difficult, but it will also tend to alter the position of the calf in the womb. And another important circumstance has been clearly proved, which is, that giving pregnant cows impure water is a more certain cause of abortion, or slipping calf, than any other. But to return to the subject of milking, let us observe, in the first place, the intimate connexion which exists between the fourth stomach and the udder. If the former becomes inflamed or disordered, the latter is sure to sympathize with it: and if the udder is materially injured, the stomach participates in the injury. This is another circumstance which should induce us to be very careful in feeding milch cows whenever we are under the

necessity of taking them from their natural pastures. When mangel wurzel was first introduced, considerable injury was done to many cows by giving it profusely. Sir Mordaunt Martin states, in the Farmers' Journal (1814), that "all Mr. Coke's cows that were fed upon mangel wurzel, and mangel wurzel only, for a few days, strewed upon grass land, in the same manner that turnips are given in some counties, were affected with palsy, and that some of them lost their milk; also, that as soon as the mangel wurzel was discontinued they began to recover." In the same journal it is stated, by another practical farmer, that "when this root (mangel wurzel) has been given in large quantity, and without hay, it has in many instances caused a partial paralysis of the hind parts, the animals appearing as if they had been injured in the back:" and it is added, "Lord Crewe gave 60 lb. a day to each milking cow, with a proper proportion of hay, not only with impunity, but with the best effect."

In another number of the Farmers' Journal I find the following statement:—"In the spring Mr. Birch gave each cow a bushel of mangel wurzel daily. A sweet flavour was soon distinguishable in the milk, the quantity increased, and the butter partook of the sweet flavour of the milk. The cows were very healthy, and remained so through the summer. The second year's crop was given in part to the cows as

soon as taken from the ground, and the same improvement was observed in the milk and the butter, and likewise in the condition of the cows. As the writer (Mr. Birch) wished to save a pasture for mowing that season, he reserved the other part of the roots till the spring; and he found them in the month of May as sound as when first gathered, and they remained so until the cows had finished them. The latter end of June I gained my crop of hay (he adds), had delightful May butter, and my cows had all the appearance of the highest state of health." On looking over several numbers of this valuable journal, I find many letters of a similar nature to the foregoing; but, lest I should tire the reader, I shall copy only two more. "On the morning of the 18th of October, 1814, two milch cows that had calved in the spring were turned into an over-eaten pasture, and fed every morning and evening with hay only. The milk was measured at each meal; the cream also was measured, and the butter weighed at each churning. The result was as follows for one week: 101 quarts of milk, 5½ quarts of cream, 4½ pounds of butter. The cows remained in the same pasture another week, and were fed with mangel wurzel and hay, each cow having half a bushel, sliced, and given to her every morning and evening—the following was the result for one week; 130 quarts of milk, 8½ quarts of cream, 6¾ pounds of butter. The cows

remained in the same pasture another week, and were fed with hay only—the result then was, 87 quarts of milk, 4¼ quarts of cream, 3¼ pounds of butter. The same cows, with eight others, have been feeding on mangel wurzel and straw for the last six weeks, and are all doing well."——The following letter is from Mr. Sibson.

Analysis of Mangel Wurzel.

One thousand grains contained

Sugar	50 grains.
Mucilage	22
Starch	2
Extract	6
Woody fibre	35
Water	885
Total	1000

" From this analysis it appears that mangel wurzel contains nothing deleterious, but very much of a nutritive and most wholesome component. The quantity given to each cow in Ireland has been from 25 pounds to 112 pounds daily, not only with impunity, but with the best effects, both as to the dairy and in feeding of cattle for the butcher: it was accompanied however by a moderate quantity of hay, and in some by an intermediate feed of turnips. Mr.

Pomeroy ordered three wheelbarrowsfull of this root, fresh pulled from the ground, to be thrown to his milch cows on a pasture ground. The food was so delicious, that they contended for exclusive possession, and the strongest having succeeded, she continued to devour the roots with avidity till all were consumed, and herself gorged beyond the possibility of recovery: but in this case, instead of paralysis, the same symptoms took place as from unrestrained feeding upon fresh clover. The rest of the cows have been fed upon the same diet, given in moderation, with a proportion of hay, and are in perfect health. The necessity of caution in the use of this root, also of clover, turnips, and aftermath, seems now fully established, and no injury need be apprehended when proper care is taken in feeding the stock. The value of mangel wurzel is now fully established beyond contradiction; and if due attention be paid to the soil, the seed, and the season, its cultivator will rarely be disappointed." The following is added as a postscript: "According to Sir Humphrey Davy, the nutritive parts in vegetables consist of sugar, starch, gluten, vegetable jelly, and extract; of these gluten is most valuable, next sugar, then starch, and last of all jelly and extractive matter."

In several articles of the Swedish periodical work named Amenitates Academicæ, this interesting subject (food for cattle) is pursued with

great spirit and high advantage to the most important purposes of practical husbandry. The following tables are there given of the most agreeable kinds of food for cattle and other domestic animals, deduced from an exercise of that wonderful instinctive power of selection which enables them to crop those which are a nutritious food for their own species, and to reject the rest. By one of these tables it appears of 494 species of indigenous plants of Sweden (three-fourths of them common to our own country), which were offered to horned cattle, 276 were eaten and the rest refused. That goats, out of 449 species, rejected 126. Sheep, out of 387, would not touch 141. Horses turned away from 212 out of 262; and swine out of 243, made choice of only 72. In the same interesting work we have a like series of experiments on a great diversity of insects and worms, with a view of ascertaining how many of them are devoured or rejected by our common poultry. This experiment seems to strengthen the opinion with regard to feeding the milch cow, with which we set out; namely, that no food, or manner of feeding, can equal the good old natural pastures, when milk, cream, and butter, are the objects of the dairy farmer. It has been stated, however, on very respectable authority, that butter, equally good and rich in quality with that produced on the old fertile pastures, has been afforded, while cows have been foddered

in their stalls, on cut clover, rye-grass, and other kinds of green food. It is of the utmost importance in the management of a dairy, that the cows be treated with gentleness, and soothed by mild treatment, especially when young and ticklish, or when the teats are tender, in which case the udder should be bathed with warm water before milking, and touched with a little of the best salad oil. They should then be milked with the greatest gentleness, otherwise there will be danger of their becoming stubborn and unruly. By some it is thought necessary always to wash the udder with clean water before milking. It is a very general practice to milk cows only twice a day; but when they are abundantly fed with the artificial grasses, it is better, perhaps, to milk them three times a day during the whole of the summer season; viz. very early in the morning, at noon, and at night; for if milked only twice a day when liberally supplied with succulent and nutritious food, they will yield a much smaller quantity of milk in the twenty-four hours than if milked three times. It has indeed been observed by some attentive inquirers, that a cow in these circumstances will give nearly as much milk at each time of milking, if milked three times, as if she were milked only twice. This, however, is a statement which has not probably been submitted to the test of experiment. It seems, however, to have been clearly ascertained, that

if the milk be not thoroughly off drawn at each time of milking, not only will the quantity of the produce of the dairy be diminished, but the quality also will be impaired. The milk that is left seems to be absorbed into the system, and nature generates no more than to supply the waste of what has been taken away; and by continuing this practice, the diminution of milk goes on, until no milk is formed. This is the practice which is pursued when it is intended to dry up the udder.

The following is the result of a series of experiments made by Dr. Anderson, a gentleman who has devoted much time and attention to the improvement of the dairy, and has distinguished himself not less by the care and attention with which his experiments were conducted than by the candour and sound judgment with which he has reasoned upon them. These experiments, are so simple and plain, as to be easily understood by every dairy-man.

Dr. Anderson's Experiments.

Having taken several large tea cups, exactly of the same size and shape, one of these cups was filled at the beginning of the cow's milking, and the others at regular intervals till the last, which was filled with the dregs of the stroakings. These were each weighed, the weight of each cup being known, so that the quantity of

milk in each was precisely the same; and, from a great number of experiments frequently repeated with many different cows, the result was in all cases as follows:

The quantity of cream obtained from the first drawn cup was, in every case, much smaller than that which was last drawn; and those between afforded less or more, as they were near the beginning or end. The quantity of cream obtained from the last drawn cup, from some cows, exceeded that from the first in the proportion of 16 to 1. In other cows, however, and in particular circumstances, the disproportion was not quite so great; but in no case did he find it fall short of 8 to 1. In the next place the difference in the quality of the cream was much greater than the difference in quantity. In the first cup the cream was a thin tough film, in the latter the cream was of a thick buttery consistence, and of a glowing richness of colour that no other kind of cream is found to possess: and lastly, the quality of the milk which remained after the cream was separated was, perhaps, still greater than either in respect of the quantity or quality of the cream. The milk in the first cup was a thin blueish liquid, like as if a large proportion of water had been mixed with ordinary milk. That in the last cup was of a thick consistence and yellow colour, more resembling cream than milk, both in taste and appearance. From this important experi-

ment it appears, the Doctor says, that a person, who by bad milking of his cows loses but half-a-pint of milk, loses in fact as much cream as would be afforded by six or eight pints at the beginning, and loses besides that part of the cream which alone can give richness and high flavour to the butter. In the second place he says, that if milk be put into a dish, and be allowed to stand until it throws up cream, that portion of cream which rises first to the surface is richer in quality and greater in quantity than that which rises in a second equal portion of time; and the second more than the third, and so on. Thus the cream decreases in quantity and declines in quality, as long as any rises to the surface. It has been suggested, and I think very properly, that during the heat of summer cows should be sheltered by suitable sheds, where they may be advantageously fed with tares, cabbages, turnips, potatoes, &c.; and it is probable, that by indulging the animal in a little variety with regard to food, its health would be improved, and the formation of milk increased. Before I conclude this introductory chapter, I think the reader may consider the following experiment worthy of attention. A meal's milk of one cow was milked into five vessels of the same size, and then the milk was separately examined in each, in the order in which it was taken. The result was as follows:

No. 1	contained of cream	5 parts.
2		8
3		$11\frac{1}{2}$
4		$13\frac{1}{4}$
5		$17\frac{1}{2}$

To ascertain whether the quantity of curd, or cheesy matter, differed in like manner, he had a young and healthy cow milked clean into ten different vessels. The first drawn was, as usual, the heaviest, and the last contained the most cream. After the milk was nicely skimmed, I found its weight in an inverse ratio. Now the first milked was the lightest, and the last the heaviest and richest in caseous matter; so that the milk obtained last is better also in regard to the quantity of curd. In situations where green food cannot be obtained in sufficient quantity, even in summer, it is of importance to inquire what kind of food may be most advantageously substituted for it. It has already been shown how profitable mangel wurzel has been found in this respect, and it would not be going too far, perhaps, were I to place parsnips next in the list of the nutritious roots fit for the milch cow. In Jersey this root has been used from time immemorial, not only for feeding milch cows, but for fattening them also; and it is said, that better beef or butter is not to be met with anywhere. If parsnips are sown

in August, they will live over the winter; and thus an early crop may be obtained. Another method has been proposed for feeding cows when green food cannot be obtained, and is said to have produced a saving equal to three-fourths of the food. It is by boiling, or steeping the hay in hot water, and giving the animal the water or hay-tea to drink, as well as the steeped fodder to eat. The advantages of this plan have been clearly demonstrated, upon a large scale, by that eminent agriculturist, Mr. Curwen, who cooks all the food for his horses as well as cattle, by means of steam. The food he generally employs is, I believe, chopped straw, hay, Swedish turnips, and potatoes. I have seen somewhere a calculation of his of the daily expense of feeding each animal, and I do not think it amounted to more than 5½*d*. I must now conclude this interesting subject by observing, that it is in this, perhaps, as in all other things, most profitable to follow nature as closely as we can; and as in the natural pastures a great variety of herbage has been provided for the animal, it may be useful, perhaps, when cows are confined, to vary their food a little; and as there can be no doubt that exercise tends to the preservation of health, let the cows be made to walk about the yard, barton, or other convenient place, once or twice a day. It may be said, however, that cows, as well as horses, may, by perseverance, be brought to live upon food

which at first their natural feelings would lead them to reject. This is in some respects true; and I now know a farm-yard where there is a pond, which is literally nothing more than the drainings of the yard and the dunghill, with the washings from the roof of the stable: yet habit has not only reconciled the palates of the horses that are kept there to this filthy water, but has even given them a relish for it; so much so, that if, when returning from a journey, the waggoner happens to stop at a nice running brook, near wells, to water, they refuse to drink unless very thirsty, and then they just sip a little in order to moderate their thirst until they return to their delicious dung-water. I watched the progress of two oxen that were fattened in this yard on hay and potatoes, and to all appearance they became good beef; still I cannot help suspecting that this goodness was, in great measure, apparent only, and that such beef, when placed upon the table, was found very deficient in fine flavour, or at least inferior to the flesh of an animal that had been supplied with wholesome water. About a month ago a fresh cow was put into this yard, and it was really painful to watch the poor animal; for the three first days she scarcely eat or drank any thing. She seems now, however, to be in some measure reconciled to the water; and is so far improved in appetite as to eat 112 pounds of good hay in a week. Thus we see that necessity is a hard

master, and will generally be obeyed in the end. But surely the circumstance of animals drinking or showing a preference for filthy water, will never be adduced as a proof of its salubrity or utility. Lest any one should attempt to support such a position, I think it right to remind the reader of the improvement that took place in Mr. Dimmery's dairy (see Preface to the Essays), when he fenced round his ponds of filthy water, and had wells dug on his farm for the purpose of watering his cattle. However innocent filthy water may be, with regard to animals that are fattening or kept at work, one thing is certain, that it materially injures the quality of milk, butter, and cheese, and diminishes the quantity—that it not only often causes warping or slipping calf, but also engenders diseases, especially bad udders, red water, and scouring. As to the effect it may have on the flavour of beef, I believe it is a point that has not yet been enquired into. There is still one circumstance I have omitted to notice, and as it goes a little way towards supporting a point I have been endeavouring to establish, I must take the liberty of adding it. In speaking of the excellence of the butter made in the Highlands of Scotland, which has been generally attributed to the sweetness of the pastures in the remote glens, where their cows are for the most part fed, and by Doctor Anderson rather to their peculiar method of milking; that is,

they let the calves suck off the first portion of the milk, which is the thinnest, and apply the remainder to the purposes of the dairy, I should have observed, this method was found to fail on trial being made with one cow, and the circumstance was related to me by the person who witnessed it. After a little time it was found that the cow let down the richest portion of her milk to the calf, and that what they milked off afterwards was quite as thin as the first portion is found in the ordinary way of milking.

A

COMPENDIUM

OF

CATTLE MEDICINE.

INTRODUCTION.

No one can be competent to prescribe for cattle without a careful examination of the sick animal, and an accurate notice of the symptoms of the disorder, and the effects of his treatment. It is too much the practice for druggists to dispense medicine to cattle without seeing the patient, or without having ever seen an animal labouring under a similar disorder. They are, in general, totally ignorant of the subject; and their only pretensions are the possession of certain receipts for certain disorders, which they never saw, and perhaps never wished to see. Every farmer may easily make himself competent to prescribe for his own cattle, and ought to do so. The few medicines that are necessary, he should keep, and I will endeavour to teach him how to use them. The few instruments that are required, he should also keep, and I will point out to him what they are, and in what manner he should make use of them; but let

him never attempt to prescribe for cattle without carefully examining the sick animal, if it be in his power to do so. All the important disorders of cows and oxen may be divided into three classes. The first is caused by feeding too greedily upon clover or common grass, especially in the fall of the year, when grass is abundant, and the mornings become frosty. The second class depends upon an accumulation of excrement in the third stomach, and a consequent derangement of the digestive system. The third class depends upon repletion of the blood-vessels. Disorders of the second class generally occur late in winter, or in spring; those of the third in summer; and those of the first, as I have before stated, in the autumn, after the wet weather has set in. At this period the grass becomes abundant, and less nutritious than in the spring and summer; and then the animal often loads his stomach, and becomes hoven, or blown, or what is called *fog sickness* takes place. When a cow becomes ill from an accumulation of food, or rather excrement, in the third stomach, there is costiveness, loss of appetite, loss of the cud, swelling of the udder, bad milk, and a variety of symptoms, which nothing but personal and careful observation can enable the farmer to distinguish. He will then find that they are all referable to one cause, which I have pointed out; and require only a simple treatment, which will be described.

These diseases are very common at the time I have mentioned; and such are the diseases in which the drenches of cow-doctors and druggists are given without doing mischief, and sometimes with good effect. But in the inflammatory class of diseases their drenches are poisonous; and there is not one in a thousand that knows how to treat them, though the treatment is extremely simple. In these diseases, therefore, the animal generally dies. The symptoms of internal inflammation, or fever, are quick breathing, hot horns and ears, and clammy lips, the blood-vessels of the white of the eye distended or full, but seldom any redness of the internal surface of the eyelids, as in the inflammatory disorders of the horse,—hanging of the head and ears, and dejection of countenance, quick and hard pulse, often exceeding one hundred in a minute. Now, in distinguishing inflammatory diseases, the season of the year, the kind of pasture they are in, the milk they have given, or the number of calves they have had, and their age, are circumstances that must always be taken into consideration. A young cow or heifer, for example, that has not been removed from her native climate, has a strength of constitution which in an old cow, that has had many calves, and especially if she has been what is called a free and good milker, is nearly worn out. The treatment, therefore, must be adapted to circumstances. A young

healthy cow, affected with an inflammatory disorder, will bear the loss of two gallons of blood; but in cows of the latter description it will be necessary to bleed with caution. There is a period when it is advisable to give up milking a cow; and this period is generally made known by a gradual obliteration of the quarters, as they are termed. This process generally begins in one quarter, and in a short time spreads to the other on the same side. Thus the process of obliteration is going on in one half of the udder at the same time. Cows at this age should be kept at grass, in short sweet pasture, which will give strength to the digestive organs, and enable them to acquire fat without danger of inflammatory disorders when they are turned into better grass, or put up for stall-feeding.

The fattening of calves and lambs is a subject of importance, and may be conducted with greater certainty than it now is, by careful attention to the state of the stomachs. When the cow's stomachs are disordered, the milk is bad, generally, in one quarter only; and if the calf sucks this teat, his stomach becomes disordered in a degree proportionate to the bad quality of the milk. However good the milk may be, he will, if not prevented, often suck too much at a time, and thereby load the stomach; a repetition of this excess will establish a disorder in the calf's stomach. The same observation applies to lambs; but it should be observed, that the cow

was evidently designed to furnish milk for man, as well as for her own young, and that this excess is more likely to happen to calves than to lambs. To fatten lambs early, that is, about Christmas, it has been found a good plan to confine them, and let them suck the ewes only twice a day; but in the intervals they have barley or oatmeal placed before them, mixed with a small quantity of powdered chalk, to correct any acidity that may take place in the stomach. This plan has been practised with great success by Mr. Cooper, of the White Hart, Bath. With regard to the fattening of oxen, we should always attend to the state of the digestive organs, and bring them to a healthy condition before they are put into good pasture. To accomplish this, they should be placed in a situation where the pasture is rather bare, that they may be obliged to feed slowly, and have sufficient exercise in obtaining their food. See ESSAY ON RED WATER. There are other circumstances to be attended to in the process of fattening cattle, and other domestic animals, that are employed for food, which will be noticed in a separate chapter. See the article on FOOD and WATER, also that on FATTENING CATTLE, &c.

CHAPTER I.

STRUCTURE AND ECONOMY OF THE DIGESTIVE SYSTEM OF THE COW.

Of all the diseases of cattle and other domestic animals there are none of so much importance as those of the stomachs and bowels. I shall therefore begin this treatise with some observations on the structure and functions of these organs in cattle and other ruminating animals, because there are some curious peculiarities in the digestive system of these animals, of which it will be useful to obtain a knowledge.

Of the Stomachs.

There are four stomachs in the cow; three of which have internally a cuticular covering by which their sensibility is considerably diminished; but the fourth is covered with a highly sensible and vascular mucous membrane which secretes the gastric juice; and it is in this stomach that the most important part of the digestive process is performed. The first stomach is named the *rumen*; the second, the *cellular* or *honeycomb* stomach, and by the French *le reseau* and *le bonnet;* the third the *foliated* or *leaf stomach.* The fourth stomach is named by the French *la caillette,* which signifies the curdling

or coagulating stomach, a term, which in the sucking calf would be very proper, because the milk that is taken in goes immediately to the fourth stomach, and is always coagulated; but in the cow it would be better to name it the *fourth* or *true stomach.*

Of the Rumen.

This is a very large muscular bag or reservoir lined externally by a membrane named peritonæum, and internally by a cuticular or insensible membrane, similar to that which lines the œsophagus, and about one half of the horse's stomach. It is of an oblong form, is situated obliquely in the cavity of the abdomen, and when filled (that is, as we find it in cattle that are slaughtered without any previous fasting) it occupies about three-fourths of that cavity. It is necessary to bear this circumstance in remembrance, as it may enable us perhaps to account for the frequency of abortion and difficult parturition in cows. (See Abortion and Calving.) On the cuticular or internal surface of the rumen, there are innumerable small processes or eminences which it is difficult to describe: this however is not necessary, as it may at any time be seen by purchasing a pound of tripe; the same may be observed with regard to the internal surface of the second or cellular stomach, which may be readily known by the

resemblance it bears to the cells of the honey-comb. The foliated, or third stomach, is never used as food, but is given to dogs or pigs. The fourth stomach may be distinguished in tripe by its dark colour; but its beautiful structure can only be correctly known by an examination of the entire stomach before it is boiled. A horse in feeding masticates the food sufficiently before it is swallowed; but the cow swallows her food in a more gross or coarse state; and having filled the rumen sufficiently, she lies down to ruminate. The pharynx and œsophagus of the cow is much more capacious than that of the horse, which enables her to swallow a much larger and coarser morsel. When the œsophagus arrives at the first stomach it is continued forward to the second and third stomach in an open state, or like a shoot, but the animal seems to have a power of closing it occasionally, so as to convey the ruminated morsel immediately to the third stomach, and liquids to the fourth stomach. On examining the outside of the rumen we find in some parts strong muscular bands, which, by contracting, appear to divide the cavity into different compartments; and it seems probable that it is by means of these bands, together with a gentle contraction of the muscular fibres of the other parts of the rumen, aided by the contraction of the abdominal muscles and diaphragm, that the food is forced back into the mouth, to undergo a per-

fect mastication. It has been supposed that the numerous small eminences with which the internal surface of the rumen is lined secrete some fluid necessary to the preparation of the food; but they may only be designed as a defence against the coarse fibrous parts of the food.

Rumination, or Chewing the Cud.

During this process a quantity of saliva is poured out by the different glands proportionate to the dryness of the food: according to Chabert no less than from three to four pints during the time a cow is eating a bushel of dry bran; this not only facilitates mastication and swallowing, but may assist also in the ultimate part of the digestive process, that is, the conversion of the food into chyme, which takes place in the fourth stomach. When the morsel which has been forced up from the rumen has been perfectly masticated, it is again swallowed, and conveyed to the second, or cellular stomach, from which it passes into the fourth stomach, after undergoing a further preparation.

The Cellular or Second Stomach.

The internal surface of this stomach is something like the cells of a honeycomb, but rather irregular in form and size: and at the bottom of each cell we may observe minute subdivisions. The whole surface is covered with little eminences like minute pimples, which probably

secrete some fluid to be mixed with the ruminated morsel before it passes into the fourth stomach. At the part where this stomach communicates with the fourth, instead of the small eminences just described, we observe a sort of net work or long spine-like processes stretching out, which seem to act as a grate or strainer, keeping back any hard bodies that may have been swallowed. It is remarkable that it is in this stomach only such things are found, and never, I believe, in any other, except hair balls, which appear to be formed in the fourth stomach. Pins and even nails have been found in the cellular stomach, according to Chabert and Girard. I have found small bits of wood or stick, which had been kept back, and were entangled by the grate-like processes before described. The capacity of the second stomach is about seven or eight inches in diameter; it seems to be designed as a receptacle for the more fluid parts of the food or water, and to moisten and otherwise press on the ruminated morsel from the third stomach.

The Foliated or Third Stomach.

This stomach, when full, approaches to the globular form ; but when the animal is killed after fasting twenty-four hours or longer, a practice often adopted by butchers, it bears some resemblance in form to a kidney. It may be considered as a strong muscular bag supplied

internally with numerous leaves, between which the food passes to undergo a further preparation. These leaves are covered with small processes of various sizes, and somewhat different in form; some of them are of a conical form, not unlike the spines or prickles of the bramble or dog-rose: all these processes are supposed to supply some liquid necessary to the preparation of the food.

The Fourth Stomach.

In this stomach the preparation of the food is completed, and it is gradually changed into a substance named *chyme;* from this substance *chyle* is separated as it passes through the small intestines. The chyle is absorbed by the lacteals, and conveyed to the thoracic duct, from whence it passes into a large vein near the heart, and mixes with the blood. The internal surface of the cow's fourth stomach, by which the gastric juice is secreted, is much more extensive than that of the horse, and this is accomplished by its being thrown into large plaits or folds; its external surface is smooth, like that of the other stomachs, and is of considerably less extent than the internal surface. The bowels of a cow are from 50 to 60 yards in length; the last I measured was 55 yards: but the horse's bowels, though only from 30 to 35 yards long, are much more capacious.

Of the Udder.

If we examine the udder of a milch cow that has had two or more calves, we shall find it composed of cells of different sizes, becoming larger as they approach the teats: but the udder of a heifer, immediately after her first calving, has a very different appearance. There is a small portion of cellular structure towards the teats, but the other parts have rather a granulated appearance, and by pressure yield milk from innumerable pores. In a cow that has had several calves, we find two large veins proceeding from the udder, and passing up under the belly. These are remarkably large when the udder is full of milk. On examining cows that die with a good deal of milk in the udder, we find in this vein a mixture of milk and blood, and sometimes the blood appears rather oily. These veins are commonly named the milk-veins by dairymen; and I was once inclined to believe that they really were milk vessels; and from the large cells of the udder, I thought it appeared more like a reservoir or receptacle for milk, than a glandular structure for secreting it. But after examining the udder of a heifer, immediately after her first calving, it certainly had a glandular appearance, as I have before noticed: and upon looking for the milk-veins, as they are termed, I could not find any thing of the kind. It is of little consequence, however,

whether the milk be formed in the fourth stomach, or by the udder; for it is certain, that whatever disorders the fourth stomach will disorder the udder, and spoil the milk in one or more of the quarters; hence we may see how important it is to attend more than is commonly done to the manner of feeding cattle. The udder is said to consist of four quarters, each quarter having an excretory duct or teat, at the extremity of which there is a contrivance for confining the milk, but in a limited degree; for if the milk be suffered to accumulate in the udder by neglecting to milk at the usual time, or by muzzling the calf, as we often see in the market, it will at length force its way through the teat, and be seen passing off in drops or a small stream. Having now given such a description of the stomachs, the bowels, and the udder, as may render the observations I shall make on some of the diseases of the cow more intelligible to the reader, I will proceed to make some remarks on the manner of feeding.

On Food and Water.

Attention to the quantity as well as the quality of water given to cattle, is a matter of more importance than it is commonly considered to be; and I am convinced that if calves, as well as cows, were limited in water, or had only a small quantity of water, it would tend to prevent the quarter ill, red water, and scouring.

When a calf or yearling heifer is put into rather bare pasture, through which a stream of water runs, it is not likely that he will drink more than is useful; but if the pasture is more abundant, he will probably eat and drink as much as will do him harm. If he has been accustomed to drink clean running water and is put into a field of good pasture where there is only a pond of stagnant rain water for him to drink at, he will probably eat no more than will do him good, because he will not drink too much water. In rearing young cattle it is of importance that they should have a sufficient quantity of wholesome food, especially in winter; but it is equally necessary that they should have also as much exercise as is conducive to health and the growth of the various parts of the body, with as much water, and no more, as is necessary or favourable to digestion. In other circumstances, young animals, like young children, will continue eating when they should be using exercise, and after eating an improper quantity they feel unusually thirsty. Having drank freely, an appetite for food returns, and they are tempted to eat more, especially in good pasture where they can get it without exercise. In this way they gradually acquire immoderate appetites, or are attacked with the quarter ill. Older cattle that have thus or by other means acquired an immoderate appetite, will also, when put into situations where they can indulge freely in food and

water, soon form too much blood, by which the nervous system will be depressed, and consequently the strength of the digestive system, as well as of the whole body, will be more or less diminished. In this state they are susceptible of various diseases, or, in other words, this state constitutes what in medical language is called *predisposition* to disease: and improper management with regard to feeding and water may be considered as the *remote* cause of the diseases which may occur. It is a fact, not sufficiently known, that when a cow has been accustomed to drink filthy water, even the washing of a dungheap, they acquire in a little time a great relish for it, and drink of it immoderately. Such water appears to stimulate the nerves of the stomach and excite a sensation which gives pleasure to the animal. When a relish for such water has been established, it is difficult to get them to drink clean running water; perhaps, when very thirsty they may be induced to sip a little, but they take care to reserve their appetite for their favourite beverage, of which they drink immoderately as soon as it is within their reach. I have been informed by an experienced correspondent, that he once saw 14 cows belonging to one farmer affected with red water at the same time, and that it was brought on by drinking turf or peat pit water. He says, that about Proud Preston, in Lancashire, at a place called Leland Mosside, there were more cows affected

with red water than round the country for nine or ten miles, and that it was brought on by drinking peat pit water. I have no doubt that cows acquire a strong relish for this water, and are led to drink of it immoderately, in which case they always eat immoderately if they can obtain sufficient food. The evils arising from immoderate drinking and eating are often very gradual in their approach and in their progress, which is the cause of their not having been sufficiently attended to at an early period; and it is to be regretted, that from a want of sufficient reflection upon the causes of diseases, the *remote* cause has been so little noticed by farmers. The following circumstance has lately been communicated to me. A farmer of Somersetshire had 40 head of store cattle, which he was feeding with mangel wurzel, parsnips, and hay. One of them could never be prevailed upon to drink, though repeatedly offered water from a pond and from a pail. This animal, however, when slaughtered, was found to be the best of the whole. I have been informed that there are farmers, who, in rearing calves, always keep them in a field where there is no water, and that they are not only preserved from the quarter ill, but thrive better in every respect. In rearing cattle, the object of the farmer should not be to fatten, or force them, as it is termed, but to preserve their health and invigorate their constitutions. To accomplish this, they should

have a useful degree of exercise in obtaining their food, and no more water than is necessary to digest it.

General Observations on the Causes of Diseases.

I have observed in the foregoing article that the *remote* cause of the diseases of cattle is generally improper management with regard to feeding and water; but we may go farther back than this sometimes, and trace it to inattention with respect to breeding. If stock be chosen for this purpose of weak constitutions, the probability is that their progeny will inherit this in a greater or less degree. Another circumstance to be considered is the improper manner of feeding cows we often observe during their pregnancy. This is often the cause of abortion, and of difficult calving, by changing the position of the calf in the womb. Having considered the *remote* cause of diseases, let us see in what manner they operate, or establish a *predisposition* to disease:—it is by weakening the brain and nervous system generally. Whatever causes an improper degree of excitement in the brain and nervous system, will weaken not only the stomachs and other internal organs, but every part of the body also. When an animal is fed improperly, the stomachs, and other parts concerned in digestion, require a greater degree of nervous energy to perform their respective offices. By this improper ex-

penditure of nervous power, the brain itself in time is more or less weakened; and as there is the greatest demand for nervous power by the stomachs, the parts, especially the skin, will be more sparingly supplied with it. It must also be considered, that when an animal eats and drinks immoderately, he will form an improper quantity of blood; by this, not only will the brain be oppressed, but the heart and blood-vessels, having the more labour to perform, will require for the purpose a proportionate supply of power from the brain. Under these circumstances, how susceptible must the animal be of morbid impressions, especially those produced upon the skin by a cold moist atmosphere, during the night particularly.

This, I believe, is the way in which diseases are brought on in cattle; therefore I consider that a cold moist atmosphere, especially cold fogs during the night when animals are disposed to sleep, and are then still more susceptible, this, I say, I consider as the general exciting cause of disease. The blood of cattle is naturally thinner than that of horses, and their nervous system weaker; this is more particularly the case when the former are in the state above described. It is rather extraordinary that the pulse of cattle has never been attended to. I have never seen it noticed in any French or Italian work on veterinary medicine; and I have known an English veterinary surgeon of great

experience in the disease of cattle, upon being asked the question, say, that the pulse of cattle was the same as the horse's pulse as to the number of pulsations in any given time; whereas after a careful inquiry into the subject I found that the pulse of cows is from 60 to 70 in a minute, and when near the time of calving 90 or more; while the pulse of the horse is about 40. This I consider a confirmation of what I have before observed, viz. that they have a weaker nervous system than horses. I am of opinion that the draining of land, which has become so general of late years, has greatly contributed to the preservation of the health of cattle, and would have done much more had proper attention been paid to them in regard to food and water. There is a small field adjoining the moat which surrounds the Bishop's Palace at Wells, which has always been injurious to the health of cattle. This can only depend, I think, upon the cold fogs that must happen there, and a predisposition to disease in the animals that suffer. I should have remarked also that there is a stream of water constantly running through part of the field, and that the pasture is good. To prevent the diseases which so often happen in the rich meadows adjoining rivers is not, I think, difficult; though it requires some labour. It can only be accomplished by giving them as much water as may be found useful, and driving them to some higher situation where there is

only moderate or rather bare pasture, every evening. With regard to the quantity of water necessary, I have to observe that at one farm in Gloucestershire, where the land was good, and cattle had free access to ponds, three farmers were nearly ruined by the bad luck, as they termed it, which they had with their cattle. The fourth who occupied the farm sustained great losses for about three or four years, when thinking that the water might be the cause of the evil, he fenced off his ponds, and pumped water for them into troughs; after this he sustained scarcely any loss, and the quantity and quality of his cheese and butter were greatly improved. As to the useful quantity I would advise the farmer to ascertain that point by attending to the appetites of his stock; and having ascertained this, he may gradually diminish the allowance of such as are immoderate, and allow them only clean water. I once communicated a circumstance to the Bath Society which appeared to excite some attention. A piece of good grass was reserved for some cattle, as they had work to do in some adjoining land. When turned in they were soon after attacked with violent scourging; thinking the grass was the cause, they were put into some other pasture where there was no water, on which account they were driven back to the former field to be watered, no suspicion being entertained of the water in that field being unwholesome; on the

contrary it had always been considered very good, being a pond of spring water. The scouring, however, increased; they voided blood with their excrement, and were greatly reduced in flesh and strength. Upon examining the pond an immense number of different kinds of reptiles were found in it. A considerable quantity of lime was thrown in and stirred about in the pond; on which an astonishing sight soon presented itself,—millions of reptiles were seen coming to the surface and leaping about to escape from the almost boiling water. After some time the pond was cleared out, and two or three wheel-barrowsfull of various kinds of reptiles were found in it. When the pond had again filled, the cattle were put back into the field, and soon recovered from their scouring. A curious circumstance is related in the Medico-chirurgical Review for Sept. 1824, page 267, which proves that worms, or their ova, may be taken into the stomach with water. An infatuaated woman was persuaded that if she got some clay from the grave of a preacher who had died a short time before, mix it with water and drink a certain quantity of such water daily for a certain period, she would be secure for ever after both from disease and sin. Dr. Pickle was called upon to attend this woman. He says, "of the larvæ of the beetle I am sure I considerably underrate it when I say that independently of above 100 evacuated by stool, no

fewer than 700 have been thrown up by the stomach at different times since the commencement of my attendance. The first discharge took place after a violent mental emotion, and was preceded by a discharge of blood from the mouth, nose, and ears." "We cannot attempt to describe (the reviewers say) the various insects in all stages of larva, pupa, and perfect animal, minutely detailed by Dr. Pickle, and represented in the plates. The doctor and other medical gentlemen were frequently witnesses of the ejection of these animals, and there appears no reason whatever to suspect any disposition to imposture on the part of the patient." It is afterwards stated that "for a period of three months a great number were thrown up from the stomach almost daily, in some instances to the amount of 30 at a time. A great proportion were destroyed from an anxiety to avoid publicity, and many escaped immediately after being vomited by extricating themselves quickly from the vomit and running into holes in the floor. Upwards of 90 were submitted to Dr. Thompson's examination, nearly all of which, including two of the specimens (terebris molitor), I saw myself thrown up at different times. The average size was about an inch; many, however, which I measured were an inch and a half in length, and four lines and a half in girth. The larva of the dipterous insect, though voided only seven or

eight times, came up almost literally in myriads; they were alive and moving. The larvæ of the beetle were vigorous in the extreme, nor was it possible, without a feeling of horror, to view them frisking along the bottom of the vessel in which they were preserved, occasionally expanding their jaws, and extending their denticulated feet. Mr. Clear, of this city, has succeeded in keeping some of them alive now, after an interval of a year, in little pots filled with clay, and so secured as not to exclude the air." There is a circumstance very little attended to by those who have ponds in their fields, though an object of some importance; that is, they are in a situation where a great number of dead leaves must of necessity fall into them from the hedges or branches of trees which hang over them. This renders water very impure, especially the leaves of the ash tree. It is the opinion of some French veterinary writers that small insects which have a blistering quality, like cantharides, are found on the leaves of the ash tree, and if they fall into water and are drank by cattle, very severe disorders are caused by it. However this may be in France, there is no reason, I believe, to apprehend that there is any insect of the kind on the ash trees of this country. Another way in which the water of ponds is made impure is by the excrement of the animals themselves falling into the water, or on the slope which leads to it, while they are drinking; for

they seldom fail of voiding it when they drink, or immediatly after as they turn round to leave the pond. When water is pumped up from wells, the troughs for receiving it should be made of stone; for when water stands long in wooden vessels it acquires an offensive smell and taste, and after some time small worms are seen swimming about in it, especially in hot weather. But it is not unlikely, I think, that by properly coating the inside of wooden vessels with a suitable composition they would be made fit for the purpose, as the decomposition of the water would thereby be prevented.

CHAPTER II.

DISEASES OF THE DIGESTIVE ORGANS.

Acute Indigestion of the First Stomach, Rumen, or Paunch, commonly named Hoven, Blown, Blasted, &c.

THIS disorder occurs from the animal feeding greedily on pasture it is unaccustomed to, especially clover, and other artificial grasses. When this stomach becomes filled beyond its capacity, the food ferments, and it is so distended with air, that rumination is completely put a stop to. When this happens, a severe degree of pain is produced. The breathing is so oppressed, that the lungs are prevented from receiving sufficient air, and if relief is not quickly afforded, the animal dies. The remedy usually employed is a flexible instrument,* which being

* A patent instrument is sold for this purpose, by saddlers, in many parts of England. When this is not at hand, there is no difficulty in making an instrument for the purpose, by taking three small canes, each of them six feet long, and binding them together with waxed packthread. At one end there should be a ball of wood, about the size of a pigeon's egg, firmly secured. To introduce this instrument into the stomach, the bullock's nose should be held out as nearly in a straight line as can be with the gullet, or throat; and when held firmly in this situation by an as-

passed into the stomach, the confined air rushes out, and the animal is, for the time, relieved. The stomach then recovers its energy, and gradually throws up the fermenting food. A more common way of affording relief is by plunging a sharp knife into the distended rumen; where it is most prominent, that is on the left side, between the last rib and the hip bone. As soon as the knife is withdrawn, the air rushes out violently, and generally some of the fermenting clover is forced out with it. It is necessary, however, to introduce a suitable tube, or the opening would soon close. If there be no tube at hand the wound may be kept open by a quill or a skewer, the sharp point being first cut off, and the end made smooth and round. When the air has been discharged, one of the following drenches should be given, and the opening closed by means of a sticking plaister made of pitch, or Burgundy pitch; or either of these may be melted with a little bees' wax for the purpose. After this accident, cow-leeches, or doctors, as they are now more commonly called, usually give some cordial drench; and if it be joined with opening medicine, as in the drench for red water, such drenches do good. After this, it is a good plan to turn them into a

sistant, who grasps the partition of the nostrils with the fingers and thumb of his right hand, the operator can easily force the ball end into the stomach, and let out the confined air.

bare pasture, and let them remain there until the digestive system (for the whole of the organs participate in the injury in some degree) is completely restored. If, however, the proprietor prefers keeping the animal, and continuing the use of cordials, the following drench is the best

Cordial Drench.

A pint of mild ale, with a tea-spoonful or two of ginger.

This should be given twice a day, and continued, if necessary, three or four days. An animal that has suffered from this disorder must be fed with great care afterwards. A rather bare pasture affords the best diet for it, and if that cannot be had, bran mashes are the best thing that can be given. A repetition of this accident is more dangerous, and more difficult to relieve, than the first, and so on in succession, until it becomes absolutely incurable; for the muscular power of this organ, as well as of every other, is limited, and there is a period when it can act no longer. This organ, like every other, derives its muscular power from the brain.

Cattle, when stall-fed, as it is termed, that is, when kept tied up, are liable to indigestion, which sometimes proves fatal; and, from the information I have obtained, it appears to me that raw potatoes, and unbruised oats, or oats without chaff, are more liable to produce this effect than other food. It is probable, how-

ever, that potatoes would be found wholesome food if given more cautiously than they often are, or if boiled or steamed, and given with cut straw or chaff. When stall-fed cattle are thus affected, they are said to be blasted. The best remedy in this case is the following opening drink and clysters, composed of salt and water: half a pound of salt to four or five quarts of water (see article *Clysters*). The animal should be moved about a little, unless there is too much swelling and difficulty of breathing to admit of it. In such cases, and indeed on all occasions of this kind, it is advisable to take off some blood; and when the symptoms are urgent, and the head much affected, the quantity taken off should not be less than a gallon, or more, or until the head appears relieved. It would be proper also to introduce the flexible instrument noticed in the preceding chapter.

Carminative Drench.

Common salt	4 ounces
Powdered Barbadoes aloes ..	½ ounce
Powdered ginger	2 drams
Water	1 quart—Mix.
Anodyne carminative tincture,	2 ounces—Mix.

As soon as the drench has been given, throw up the clyster of salt and water. When cattle have been griped, or disordered in the stomach, by feeding on oats unbruised, and unmixed with

chaff, I have seen this drench afford speedy relief, and have afterwards found a considerable quantity of oats in the dung, that had scarcely undergone any change in their appearance. I have known a farmer lose three oxen by feeding them on potatoes when they were plentiful, and probably given too freely.

In the sixth volume of "Instructions et Observations sur les Maladies des Animaux Domestiques," by Chabert, Flandrin, and Huzard, there is a case noticed where they went so far as to make a sufficient opening to introduce the hand, and draw out the fermenting food. When cattle are fed on turnips, potatoes, or other root, they are sometimes *blasted*. In such cases the symptoms are seldom so urgent as when they are blasted with clover, or food of that kind. One of the following drenches will generally afford relief, especially if assisted with a clyster of salt and water. In some cases of this kind, the piece of turnip or potatoe appears to stick in the throat; this is commonly named

Choking,

and may in some cases depend merely on the piece being too large; most commonly, however, it arises from indigestion, and a consequent distension of the rumen with air. This may be seen by the swelling of the body: and in many instances when a sharp knife has been plunged into the left side, and vent given to the confined

air, the turnip is immediately swallowed. The most common remedy in these cases is to force down the turnip into the stomach by means of a moderate sized rope, about seven feet long; by this operation any confined air there may be in the rumen, or first stomach, is suffered to escape. But it is advisable, whenever this happens, as in the foregoing cases, to take away the animal for some time, and after taking one of the following drenches, to give him some exercise. The cause of these diseases is improper feeding; that is, suffering animals to indulge an immoderate appetite. Such animals generally feed quickly and greedily, and thus it happens they may be choked when feeding on turnips or potatoes before indigestion has taken place. There is another kind of indigestion, which sometimes happens when cattle are put suddenly into rich meadows or aftermath. This, in some districts is named

Meadow Sickness.

The following case was communicated to me by my friend Mr. Joseph Bromedge, of Lower Stone, Gloucestershire. Several cows were put into a piece of rich aftermath; when the proprietor went to see them, he found six of them very ill, and appearing as if they wanted to vomit. He immediately drove them out of the meadow, and put them into a field where the pasture was bare, and in which there was a

number of mole-casts. The sick cows went immediately to the mole-heaps, and began to eat the earth greedily. The proprietor did not interrupt them, but waited to see the effect. He says, that in a very short time they appeared much easier, and soon after were completely relieved. The other cows did not attempt to touch the mole-heaps. It has been proved, that when animals gorge themselves there is an acid formed which, passing into the fourth stomach, causes considerable irritation and pain; and in one gorged cow I opened, I found a high degree of inflammation in the pyloric portion of the fourth stomach, or that part nearest the bowels. This enables us to account for the efficacy of the mole-heaps; for all earths contain a large proportion of carbonate of lime, which, like chalk, is a powerful corrector of acidity.

Another circumstance has been communicated to me, confirmative of this opinion. My correspondent informs me that he has often had his cattle blasted, and has always relieved them by a drench in which there were three or four ounces of carbonate of soda, which destroys acidity more quickly than chalk. The other ingredients in the drench are half a pint of castor oil, and a quart of water. From a knowledge of these circumstances, I have been led to introduce into the following recipes or receipts, carbonate of soda. I cannot conclude this subject without reverting to the article on

food and water, in which I hope it has been clearly shown that the class of diseases of which we have been just treating may be prevented. I must not omit to observe also, that another circumstance which causes an animal to feed greedily is keeping him too long without food.

Receipts.

No. 1.

Common salt . . . . 4 ounces
Carbonate of soda . . . . 1 ounce
Powdered aloes . . . . ½ ounce
——— ginger . . . . 2 drams
Water . . . . 1 quart
Anodyne carminative tincture . . 2 or 3 oz.

Mix for one drench.

No. 2.

Common salt . . . . from 4 to 6 oz.
Carbonate of soda . . . . . . from 1 to 2 oz.
Best flour of mustard . . . . from 1 to 2 oz.
Ale and water, of each . . . . 1 pint

Mix for one drench.

No. 3.

Warm ale . . . . 1 quart
Powdered ginger . . 2 or 3 tea-spoonsful

Mix for one drench.

When no medicines are at hand give a dose of common salt with some mustard or ginger; and if there is no beer, mix a glass or two of

gin or other spirit with the quart of water in which the salt is dissolved. If the brain appears to be oppressed, which is indicated by great heaviness or sleepiness, bleed according to the emergency; and whenever a clyster-pipe and bladder can be procured, a clyster of salt and water should always be administered. It is almost superfluous to observe that when an animal has been blasted he is thereby rendered more liable to the disease than he was before, as the stomachs, and especially the first or rumen, are weakened by it. It should also be recollected that the stimulating drenches employed as remedies, though necessary to the animal's relief, are a powerful excitement to the nervous structure of the stomach, and must be followed by a proportionate degree of debility. This weakness, however, may be only temporary, provided the organ be permitted to recover by suitable attention to diet or feeding. Turning him into a field for two or three days, where the pasture is rather bare, is the most effectual restorative; but when this is not convenient, he must be fed sparingly a few days, and with food that is easy of digestion. The following precaution should always be observed: when cattle are first put into clover, vetches, rich aftermath, or in short into any pasture much better than that from which they may have been taken, let them remain at first only a few hours, or much less if it be clover, and put them into a field

where the pasture is bare; thus they may be gradually brought to remain there with advantage. Another circumstance to be ascertained is the kind of water they have been accustomed to, for if there is clear running water in the new pasture, and they have been used to filthy pond water, there will be less danger of their gorging themselves; but where they have free access to such water as they have been accustomed to, the above precaution cannot be too carefully observed. When the pasture consists of meadow land, and is situated near a river, the cold night fogs, which prevail in such places, are very injurious to cattle unaccustomed to them: therefore it would be prudent sometimes to place cattle, during the night, in some higher situation, or in a barton, and inure them to the climate gradually.

CHAPTER III.

CHRONIC INDIGESTION.*

The method of feeding cattle during the winter has a tendency to weaken the digestive system, and especially that of the milch cow. The best food for the animal, is that which

* In looking over books on cattle medicine, one may be led to believe, from the many disorders that are described in them (generally under very absurd names), that the disorders of cattle are very numerous. The truth is, however, that they are subject to very few internal disorders, a knowledge of which may be acquired without difficulty. The most simple, and the most useful manner of considering those disorders, is to divide them into two classes; that is, disorders from indigestion, or weakness of the stomachs or digestive system, and inflammatory disorders. According to Dr. Philip, in his treatise on indigestion, "A disease is not only that collection of symptoms which are present at any one time, but also those which appear in succession, arising from the same source. We shall find indigestion the most varied of all diseases; beginning from simple and apparently unimportant deviations from health, it gradually becomes so complicated, and often at length so undermines every power of the system, that it is difficult to give a view of its symptoms, which shall at once be sufficiently full and distinct. It is an affection of the central part of a most complicated structure, capable of influencing even the remotest, and each through many channels, and in various ways." If we consider the subject in this plain and simple

Nature has provided for it, and when that cannot be obtained, the best substitute is good hay. The hay, however, commonly given is not good; on the contrary, a great deal of it is either of indifferent quality, or bad. Cows that are tied up during the winter are more liable to be injured by this mode of feeding than such as are kept out; they have often, however, this compensation,—they are sheltered from the wet and cold, and generally have better hay given them than cattle that are kept out during the winter.

manner, there will be no difficulty in perceiving, that supposing the animal to be originally of a healthy constitution, the disorders of the digestive system, or stomach, are the consequences of improper feeding, assisted by the depressing influence of wet and cold weather. From this we shall be led to a conviction of the possibility of preventing those disorders by feeding the animal properly. It should be known, however, that sufficient attention is not paid to breeding. Whoever is desirous of having healthy stock, should take care that both the bull and the cow are of a sound constitution, and of a proper age. Many farmers send their heifers to bull at one or two years, which is one or two years too early. By such premature breeding, the heifer's constitution is considerably weakened, and her stock participates more or less in the weakness. And whenever the constitution is weak, it is most felt in the digestive organs. Another cause of weakness is the removing the young animal from his native climate, and especially by removing him to one that is colder. As to inflammatory disorders, the cause, the remedy, and means of prevention, are sufficiently obvious, and have already been sufficiently noticed. See Introduction.

These have the advantage of exercise, and some proportion of green food, during great part of the winter, and are thereby enabled to digest bad hay better than cows that are kept tied up. The injury which this does to the stomachs, or digestive system, takes place gradually, and when the spring returns, and the cow is turned into fresh pasture, the constitution gains strength, and the digestive power is renovated or improved. A return to the same food in the winter weakens the digestive system still more, and the renovation which takes place during the following spring and summer is less complete, and takes place more slowly. Weakness of the digestive system causes weakness of the whole body. The degree of weakness thus produced in the stomachs, and in the constitution, generally depends upon circumstances which should be taken into consideration. Cows that are of a hardy constitution resist the influence of improper feeding and want of exercise better than such as are rather weakly, or that have been brought from a warm to a colder climate, or from a poor soil to one that has been more recently cultivated:—and there is something in change of soil more than this,—that is, a disorder is often produced by change of pasture, while the difference in the pasture has not been evident. But whenever such disorders take place from changing cows from one pasture into another, when there is no observable difference between the two pas-

tures, it appears to depend upon two circumstances, viz. a previous weakness of the digestive system, and an increase of appetite and digestive power, arising from the change of food and situation. The previous weakness always depends on the winter's feeding. Bad hay abounds with fibres, and is deficient in nutritive matter; therefore, when ruminated, it is kept back in the third stomach, which serves as a press, and after the nutritive fluid has been pressed out into the fourth stomach, the fibrous parts are expelled and carried off through the bowels. In animals that have died of red water or scouring, we generally find an accumulation of hardened food, or rather excrement, for such it really is, between the leaves of the third stomach. These plates or cakes of hardened excrement appear to consist of the fibrous part of the hay matted or compressed together, and sometimes of the fibres of coarse grass, which the animal has picked up about the hedges or ditches. The muscular coat of the stomach appears tender, and the cuticular coat comes off, either wholly or partially, with the hardened excrement, the surface of which is covered with small holes, the indentations of the papillæ, or small eminences, with which the leaves of the third stomach are covered. In France, and other countries where they are fed chiefly on green succulent food, these disorders are not so common, and those that do occur are of the in-

flammatory kind, arising from repletion of the blood-vessels. These often quickly degenerate into putridity, and can be arrested only by early and copious bleeding. While we are under the necessity of feeding cattle, during the winter, on hay, and cannot always obtain good hay, we should endeavour to lessen the evil as much as possible, and use the most effectual means of relieving them, as soon as any disorder appears. The early application of remedies is a matter of great importance, and it is to be regretted that this is so seldom attended to as we find it to be. It is too common a practice to pay no attention to the disorders of cattle until they become confirmed or incurable, and then expensive and useless drenches are often employed. Chronic indigestion, then, depends upon diminished energy of the stomachs, and the exciting cause of their disorders is an accumulation of fibrous matter in the third stomach, which gradually becomes weaker and weaker, while the fourth stomach and the whole constitution participate in the injury. Another cause of disorder in the digestive system of the cow, is frequent distension of the first stomach, commonly named paunch, rumen, or belly; when this happens, rumination becomes more or less difficult. In this case also, the other stomachs participate more or less in the disease. So important is the office of the stomach, especially in the milch cow, that whenever the digestive function is

impaired, the whole body is more or less affected. Exposure to wet and cold weather depresses the powers of the constitution; and in this case the digestive system becomes weakened, and is rendered more liable to disorder. The grinding teeth sometimes are injured by the stalks of dock, or bramble, mixed with the hay, which renders mastication difficult and imperfect, and this may become a cause of indigestion. A certain degree of weakness in the stomachs will induce a disordered state of the bowels, and sometimes of the kidneys and udder. Cows sometimes become disordered in the stomachs from temporary causes; such as drinking freely of cold water after heating themselves by exercise, or by being worried by dogs; and the higher their condition, the more liable are they to such attacks: this is properly enough termed a chill, and is sometimes productive of serious diseases.

CHAPTER IV.

YELLOWS.

This disorder often occurs to cattle, and especially to milch cows, and consists in a disordered state of the third and fourth stomach, and sometimes of the first also, in which case the animal ceases to chew the cud. The symptoms of yellows are, yellowish and stringy milk, generally from one quarter only, and that quarter is hard, more or less swollen, and tender.

This disorder may take place in different degrees. Sometimes it is but slight, and only observed by the altered appearance of the milk; at others the quarter is much swollen, and the milk is changed into a fluid somewhat resembling matter, and smells offensively. In this degree of the disorder there is want of appetite, languid and dull appearance, and sometimes the animal ceases to chew the cud.

The following drench is the best remedy that can be employed: and if the disorder is not violent, nothing more will be required, except putting it into a field where there is but little grass. In more violent attacks of this disorder, the drench may be assisted by giving the animal whey every three or four hours, and throwing up a clyster. The swollen udder may have some neat's-foot oil, or olive oil, applied to it. When this disorder is neglected, or improperly treate

the udder sometimes bursts, and, after discharging matter for some time, a large fleshy fungus grows out from it, which remains for some time, and then gradually separates and falls off, while the sore which remains gradually heals. Sometimes the udder remains in a hardened condensed state, and becomes useless, or, in the language of dairymen, the quarter is lost. In the first attack of yellows let the following drench be given, and if the weather is favourable, the cow should be turned into a field where there is but little pasture.

Opening Drench for Yellows.

Common salt	4 ounces
Barbadoes aloes	½ ounce
Ginger	1 dram
Water	1 quart
Anodyne carminative tincture	2 ounces

Mix for one drench.

Anodyne Carminative Tincture.

Best Turkey opium	1 ounce
Cloves bruised	1 ounce
Best Jamaica ginger, bruised	1 ounce
Best Cogniac brandy	1 quart

—Mix them, and let them stand together in a well-corked bottle, which must be frequently shaken for three or four weeks, and it will be fit for use. At this period it may be strained off through blotting paper.

CHAPTER V.

RED WATER.

This is a disorder which occurs often, and not unfrequently proves fatal. It appears to depend on a relaxation of the kidneys, which, instead of admitting urine only to pass through them, yield or give way when there is an unusual determination of blood to them, and suffer blood also to pass as well as the urine. This being the case, it becomes necessary to inquire on what this relaxation of the urinary vessels depends; and, after a careful examination, I am of opinion that it originates in weakness of the stomach, induced by feeding on bad hay during the winter. In cows that have died of this disorder we almost always find an accumulation of the fibrous parts of hay in the third, or foliated, stomach, compressed into thin cakes, and matted together. The cuticular coat of the leaves of the stomach generally separates with those cakes of matted fibres, and the muscular coat is found weakened and distended.*

From the universality of this appearance in cows that die of red water, there cannot be a doubt, that the remote cause or origin of the red water is weakness of the stomachs or digestive

* See Essays.

system, and improper feeding during the winter. Hay that is of indifferent or bad quality not only weakens the stomachs, but affords impure chyle, and, consequently, impure blood. The water, and excrementitious parts of the blood, are carried off by the kidneys; and when these are abundant, the urinary vessels are gradually relaxed or weakened; so that when an unusual quantity of blood is formed by a change of food in the spring they suffer blood to pass off with the urine, and sometimes so copiously that the animal bleeds to death. We find, however, some variety in the symptoms of this disorder. Sometimes the bleeding is inconsiderable, and the disorder of the stomachs and bowels is the predominant symptom, and one which requires attention. At others, the bleeding is so great that the vessels burst, or are broken down, and then the urine becomes brown and turbid, and even approaching to blackness. Some land is remarkable for giving cows the red water; and from the circumstance, I believe, of the animal eating the grass of such land with greater appetite, and digesting it more quickly: hence the quantity of blood formed will soon be so great as to bring on general or partial inflammation, or force its way through the urinary vessels. This kind of pasture also gives such energy to the weakened stomachs, that the matted cakes that have accumulated between the leaves of the third stomach are forced off; and, for the pro-

motion of this object, there is such thirst in the animal that she drinks as much water as is necessary for the purpose. From this circumstance red water is often accompanied with a looseness of the bowels, the excrement being often discharged with considerable force, but in a small stream, and nearly as thin as water, often mixed with hard knobs, consisting of the accumulated matter from the third stomach: sometimes they are of such size as to plug up the fundament, and prevent the free discharge of excrement; in which case it is necessary to throw up a clyster, or remove the clots with the finger. As soon as this is done the fluid excrement passes off freely, unless stopped by other clots. There is another kind of red water, produced by blows on the loins, or by other cattle ramping upon them; and this is not accompanied by the looseness above described, or falling off of the appetite, which in the other red water is diminished, or even lost. This is generally named strain water, or red water from blows or bruises, whereas that which forms the subject of the present chapter has been named red water from indigestion. But when the bleeding from the kidneys is the principal symptom, and the stomachs and bowels are not materially affected, it has been named the inflammatory red water. This distinction must always be kept in view, and carefully attended to, as the two kinds of red water require a different treatment. The

red water from indigestion is commonly met with in cows that have weakly constitutions, or such as have been good milkers, or that have had many calves; but the inflammatory red water most commonly happens to young steers and working oxen, when first put in for fattening. The disorder most frequently happens in the spring of the year, but sometimes it occurs in the summer. The first thing to be done is to clear the first stomach from hardened matter or excrement that is lodged in it; for which purpose one of the following drenches may be given:—

Drench for Red Water.—No. 1.

Barbadoes aloes	4 to 6 drams
Common salt	4 to 6 ounces
Ginger	1 to 3 drams
Water	1 quart
Anodyne carminative tincture	2 ounces

And if this tincture is not at hand, half an ounce, or one table-spoonful, of tincture of opium or laudanum may be substituted for it. The receipt for the anodyne carminative tincture may be found in the preceding chapter. One of these drenches is generally sufficient, provided the animal is drenched with two or three quarts of whey three or four times a day, and if the weather is favourable she should be kept in a field where there is but little grass. If the

cow or steer is hot and feverish, that is, if the horns are hot, the nose dry and hot, the breathing quick and disturbed, a sufficient quantity of blood should be taken off to remove those symptoms. Sometimes a considerable quantity of blood must be taken off, even until the animal is faint, and then the drench No. 2. which does not contain opium, is most proper. The drench No. 1. is intended for cows whose digestive system has been much weakened; for in such cases there is so much debility in the stomachs that salt and aloes may do harm, unless some energy were given to the stomachs by the cordial property of ginger and tincture of opium, or, what is much better, the anodyne carminative tincture.

It should be recollected, that if we succeed in removing the hardened excrement from the third stomach, and in putting a stop to the discharge of blood with the urine, or, as it is commonly termed, in *turning the water*, the digestive system or stomachs will remain in a weakened state, and therefore some attention will be required with respect to the animal's diet. The best situation is a field where the grass is short and sweet, and where she may have sufficient exercise in obtaining a proper quantity of food. The same situation is mos fit for a beast that has had the inflammatory red water, for here both the digestive system and the kidneys will be gradually restored to health.

Drench for Red Water.—No. 2.

Epsom salt	....	from 6 to 8 ounces
Water	....	1 pint, or more
Castor or olive oil	....	6 to 8 ounces.—Mix.

Farmers sometimes substitute cream, or half-made butter, with the whey in it, for the castor or olive oil, and four ounces of common salt for the Epsom salt; and when the medicine does not operate freely it should be assisted by drenching the animal with whey. Epsom salt, however, is milder than common salt, and castor oil or olive oil is preferable to cream or butter. If aloes and ginger are not at hand, and cannot be obtained in time for the red water from indigestion, that is, for the red water in cows with weakened stomachs, that have had several calves, and have been good milkers, the common salt should be given in a little larger dose; and if no laudanum, or anodyne carminative tincture, can be procured, a wine-glassful of brandy or gin may be substituted, and one table-spoonful of flour of mustard. I would advise every farmer, however, to keep the anodyne carminative tincture, and a mixture of powdered Barbadoes aloes and ginger, in the proportion of four ounces of aloes to one ounce of ginger. This I would name compound powder of aloes. The drench No. 1. is the best for chills, yellows, bad milk, and other disorders of common occurrence, that can be given; therefore all farmers and

dairymen would do well in being always provided with the ingredients for making it.

It is a circumstance much to be regretted, that the use of bad hay for cows is so general in many parts of England, that we seldom meet with dairies where the cows are not more or less injured by the winter's feeding. Inattention with respect to breeding, and change of climate, or putting the animal into an unsuitable climate, are circumstances that contribute to the production of diseases among cattle. By reflecting on this we shall be led to the prevention of such diseases, which, on all occasions, will be found much easier than curing them.

I was informed by the late Dr. Jenner, among other circumstances relative to cattle which he condescended to communicate to me, that he had many times examined cattle that died of red water, and that he had always found a high degree of inflammation of the heart. I have lately received a valuable communication from Mr. Richard Sumner, an experienced farrier, who lives at Little Gomershale, near Leeds, Yorkshire. "As to red water I cannot say much more concerning the situation in which it most frequently occurs, than I did in my letter of July, 1821; only that I once saw six cows lying dead of red water at the same time. The farmer had 14 affected with red water at the same time, and six of them died. It was brought on by drinking turf or peat pit water. About

Proud Preston there were more cows ill of red water, at a place called Leland Mosside, than round the country for nine or ten miles: it was brought on by drinking peat pit water, though it was high lying land for five or six miles round the water. I am now satisfied of the truth of the late Dr. Jenner's observation relative to red water; that is, of its being of an inflammatory nature. Some time since I was sent for to see 13 cows ill of red water, all on one farm. One of them died soon after I got there. There happened to be a surgeon and a butcher very near, so that we opened her immediately. The heart and liver were very much inflamed, and the dung in the third stomach was almost as dry as a stick. The kidneys were enlarged and tender, the bladder full of a coffee-coloured fluid. I asked the cow-doctor what he had given? he replied 'a little binding medicine to bind the bleeding vessels up.' I proposed bleeding, and was allowed to bleed only three of them, and give an opening drench. The others were not bled, but had the same drench given to them. I saw them the next day; those which I had bled were quite well; the others were in the same state as they were the day before. I was now allowed to bleed all of them, after which I gave only one half of the opening drench. The following day they were all well. I have not lost one in the red water since."

Since it appears that turf or peat pit water

is so frequent a cause of red water, I am inclined to believe that it depends upon the immoderate quantity of water which the cows drink, and not upon any peculiar quality in the water. The enlargement and tenderness of the kidneys prove that these organs had been immoderately exercised in carrying off superfluous water from the blood. When an animal's kidneys have been thus relaxed in a certain degree, she may be considered as predisposed to red water; and it is probable that a cold, wet, chilling night may prove an *exciting cause* by diminishing the strength of the body generally, and causing the blood to recede from the surface and crowd about the internal parts. Under these circumstances the weakest parts suffer most; some of the relaxed vessels of the kidneys burst, and a discharge of bloody urine is the consequence. The first thing to be done, therefore, in this disease, is to relieve the loaded blood-vessels, and then by means of a purgative make the bowels an outlet for the superfluous water of the blood, and thereby give the ruptured vessels of the kidneys time to recover. From the colour of the urine discharged in red water, which is rather dark, inclining to purple, similar to venous blood, it seems probable that it depends on the bursting of a vein or veins in the kidney. There are many who cure red water merely by purging with common salt or Glaubers salt; but I am inclined to believe that this remedy

alone would not be found generally efficacious, though undoubtedly an essential part of the treatment. When several animals are attacked with a disease on the same farm, the first that dies should be opened and carefully examined by a veterinary surgeon or a surgeon; this would seldom fail of pointing out a successful mode of treatment.

CHAPTER VI.

DIARRHÆA, SCOURING, SCANTERING, &c.

This is a disorder that happens more frequently than red water, and I believe more frequently proves fatal, or is only partially remedied, so that the animal is made very poor or indifferent beef. A permanent or radical cure is seldom obtained, perhaps for one or more of the following causes: 1st. The animal is not attended to, or properly treated, on the first appearance of the disorder. 2d. The animal is kept in an unfavourable situation, and fed improperly. 3d. The animal is of a weak constitution, either naturally, or from frequent calving and bad feeding.

If the disorder is attended to, and properly treated on its first occurrence, and the animal is of a tolerably sound constitution, I believe it may be permanently cured by giving, in the first place, the drench No. 1. prescribed for red water, and every evening and morning afterwards the cordial astringent drench. The red water drench should be given early in the morning; and, if the weather is favourable, the animal should be turned into a field where the pasture is short. On the evening of the same day the cordial astringent drench should be given, and

if the weather is wet and cold she should be placed in a sheltered situation. The drench should be continued three or four days after the scouring has ceased, that is, after the dung resembles that of healthy cows at grass. It is a common practice to keep a scouring cow in, and feed her with hay, barley-meal, &c. This hardens the dung, but does not cure the disorder; the stomachs and bowels continue weak, and the food serves but to oppress them. When the weather is wet and cold, and good grass cannot be procured for them, they should be kept on such food as the stomach is capable of digesting, and it should be given in small quantities only at a time. There is a fine kind of bran, called *pollard* or *gurgings*, which is excellent food for them when kept within; and even at grass, if the medicine should not succeed, a small quantity of this food may be given them. It should always be recollected, however, that if the quality and quantity of the food is not suitable to the strength or state of the stomachs, instead of affording nutriment, it serves only to oppress and weaken them still further. If really good hay can be obtained, a moderate quantity should be given, but only a little at a time. The water that is given them within doors should not be very cold, and if a handful or two of wheat flour were stirred into each pailful, it would be found useful.

But when this in-door treatment is adopted

the opening drench should always be given first, and followed by the cordial astringent drench, as before described in the treatment of cows at grass. It may be found useful, during the in-door treatment, to repeat the opening drench once in three or four weeks, and give three or four doses of the cordial astringent afterwards. The expense of this drench is so moderate, not exceeding threepence, that no reasonable objection can be made to giving it twice a day, and continuing it a short time. The practice of giving powerful astringents and stimulants is very injurious; for they give a temporary excitement and energy to the stomachs, which is always followed by depression. It should always be laid down as a principle, in regard to cordials and astringents, that the dose should never exceed the quantity that is capable of producing the desired effect. By repeating this moderate dose every morning and evening, the strength of the stomachs is kept up, and they are enabled to perform their functions properly, so as to form good chyle, and consequently good blood. As the blood increases in purity, the muscular coat of the stomachs will acquire permanent strength, and so will the brain and nervous system. This constitutes the radical or permanent cure, and when this has been accomplished, we should take care to avoid the causes by which the disorder is produced.

Cordial Astringent Drench.

Powdered catechu	2 drams
Fresh powdered allspice	2 drams
Fresh powdered carraways	½ ounce
Good strong beer or ale	half a pint
Table beer or water	half a pint

Let the ingredients be simmered for a few minutes in the table beer or water, and let the strong beer be added at the time the drench is given.

Since the third edition of this book was published, I have had opportunities of examining scouring cattle that were killed after the disease had made considerable progress. On opening the fourth stomach the most remarkable appearance presented itself in the folds or plaits which are thrown up on the internal surface of this stomach, in order to give an extensive secreting surface, without a proportionate and inconvenient size in the organ itself. These plaits, in the healthy state, are about the twelfth of an inch thick, three or four inches in width, and extend from one orifice of the stomach to the other. In this scouring ox, they were nearly two inches thick, and changed to a weak semitransparent jelly, of a whitish colour; and the secreting membrane was entirely destroyed. I have found the same appearance in others, but not in so high a degree; and an intelligent

farmer assured me, that he had opened a scouring cow, and found the fourth stomach in a similar state. The whole of the bowels also were in a dropsical state, but in a much less degree than the stomach. I saw the scouring ox whose fourth stomach was in so remarkable a state, before he was killed. He was a mere skeleton, but looked rather lively, and appeared to have an appetite. In driving him to the kennel he got into a pond and continued drinking a considerable time. His rumen was quite full of haymaiden and water. This herb has a very offensive smell, and would not be eaten, I think, by an animal whose stomach was healthy. The front teeth were all loose. Though it is advisable to turn a scouring cow into rather bare pasture when the weather is favourable, yet she should not have free access to water; and if she is found eating what is improper about the hedges and ditches, she should be put into a barton. My correspondent, Mr. Sumner, informs me, that he has met with a great many scouring cattle, but has not known one perfectly cured. He stopped one by giving her a sheep's heart, liver, and lights, all chopped up together; but she died six weeks after, of a complete dropsy of the belly. When I lived at Oakhill, a scouring cow was kept in a field adjoining the house in which I resided. I was surprised to see how much she drank, and how often she was drinking. She appeared cheerful,

and had a good appetite; had taken a good deal of medicine of different kinds, without any benefit, and was then left to take her chance in this field of tolerably good grass. After a short time, the proprietor permitted me to have her killed for examination, which afforded me an opportunity of seeing the state of the stomach and bowels before the disease had made so much progress as in the cases before noticed. There was the same dropsical appearance, though in a less degree. The dropsy is in the cellular membrane, between the muscular and mucous coat of the bowels; sometimes, however, there is an effusion of water into the cavity of the abdomen.

CHAPTER VII.

FOG SICKNESS.

This disorder is rather similar to that described in Chapter II. and has received its name from the period at which it occurs, that is, at the latter part of summer, after the rainy season, when the grass becomes abundant, and the frosty mornings begin. At this period the digestive system, as well as the whole body, has become rather weak, from the summer heat, and continuance of good feeding on rich summer grass. The appetite becomes irregular or morbid, and some cattle will eat voraciously; they then lie down, when the grass is covered with hoar frost; and this, with the coldness of the atmosphere, so depresses the strength of the stomachs, as well as of the whole body, that digestion is put a stop to. The body then swells, and the animal is in great pain, appearing stupid, and breathing with difficulty. The first thing to be done is to bleed freely, for at this period there is too much blood. Afterwards the instrument called a *probang* (see note to Chapter II. where this instrument is described) should be employed and the following drench given, unless the ingredients be at hand for making the drench No. 1. prescribed for red water, which is the best that can be

given, and should be kept in his house by every dairyman or proprietor of cattle.

Drench for Fog Sickness, when the Drench No. 1. *cannot be obtained.*

Common salt ....4 to 6 ounces
Flour of mustard, one or two table-spoonsful, or, if this is not at hand, a tea-spoonful or two of ginger or pepper.
Water ....1 quart
Gin, one noggin, that is, four ounces by measure, or a quarter of a pint.

A clyster of salt and water is of use, and the animal should be made to walk, and when relieved, turned into a field where the grass is very short, that he may work hard for a bellyful. This will gradually restore the strength of the digestive system. When the stomachs have been much weakened by this disorder, a few cordial drenches of moderate strength, may be necessary; and the best, perhaps, that can be given is half a pint of good beer or ale with a little ginger in it. Cases sometimes occur, though seldom, where the symptoms are so urgent as to render it necessary to plunge a knife into the distended rumen, as described under Acute Indigestion.

CHAPTER VIII.

STAGGERS, VERTIGO, LETHARGY, SWIMMING OF THE HEAD; OR, MORE PROPERLY, PARTIAL OR TOTAL PARALYSIS OF THE STOMACH.

THIS is the highest degree of disease of the digestive system, in which the muscular power of the stomachs have been so much exhausted, that they become incapable of contracting upon the food which the animal takes in; for though the appetite for food continues either from habit, or some other circumstance, it is so depraved, that the animal eats from the hedges and ditches the coarsest and most indigestible kind. The symptoms of this disorder are heaviness of the head, and sleepiness, the animal sometimes resting his head, or forcing it against a gate or hedge, and appearing sometimes nearly or quite insensible. This disease is often incurable, in consequence of the exhausted or paralytic state of the muscular coat of the stomach, while perhaps the vital power that remains in it is the cause of the continuance of appetite, and of the animal loading it with improper food. The following drench should be given, and clysters of salt and water thrown up; for the stimulus given by the salt water to the nerves of the intestine will gradually spread to the stomach,

because both the stomach and bowels are supplied by the nerves named par vagum. And at the same time they will remove the excrement that is lodged in the bowels.

Barbadoes aloes	6 drams
Common salt	6 ounces
Flour of mustard	1 ounce
Water	1 quart mixed
Brandy, rum, or gin	4 to 6 ounces.

If the animal appears to be relieved by this drench and the clysters, he should be kept afterwards in a place where he cannot eat any thing improper, and take twice a day half a pint of good beer or ale, with a little ginger in it. Bran mashes may perhaps be found proper food for them, with a little malt in them.

CHAPTER IX.

LOSS OF THE CUD.

WHEN a cow ceases to chew the cud, or quid as it is commonly named, it is a sure sign that the stomachs are disordered; and most commonly it depends upon an accumulation of dry fibrous matter between the leaves of the third stomach. When this happens, the fourth stomach, and sometimes the bowels, become disordered also. Loss of the cud may depend at first on a disease of the first stomach only, as is the case sometimes in animals that have been paunched, as it is termed, that is, have been stabbed with a sharp knife to let out the confined air, when the animal has been blasted, hoven, or blown. After this operation, an adhesion takes place between the first stomach and the side, at the part where the operation was performed; or, in other words, the stomach sticks to the side, and rumination is sometimes in consequence more or less imperfect.

Rumination means that motion of the rumen, or first stomach, by which the food is forced back into the mouth to be perfectly masticated. This motion is not sudden and painful, like that of vomiting, but gradual, gentle, and

productive of cheerful feelings, when the animal is healthy and free from pain. By the adhesion before described, this gentle and gradual action of the first, or ruminating stomach, must be interrupted in some degree, and probably somewhat painful. Paunching, therefore, though it affords relief in some cases, is not so useful as introducing the probang, and letting out the confined air by the mouth, as described in Chapter II. As loss of the cud depends upon an accumulation of fibrous matter in the third stomach, and a consequent disordered state of the whole digestive system, the first thing to be done is to give the following drench, or that prescribed for *red water*, and marked No. 1. This last drench is most fit for cattle of weak constitutions; for such as are old, and have been good milkers; and especially when the disorder takes place while they are fed on hay, or soon after they are turned into pasture in the spring of the year. But when there is a quickness of breathing, hot horns, and other marks of fever or inflammation, the animal should be bled freely, and take the following drench.

Epsom or Glauber's salt, 6 to 8 oz.
Whey, one quart.—Mix.

After this has been given, let the animal be turned into a field, where the grass is short; and if the weather is wet, she should be kept in a sheltered barton, and fed with whey and bran

mashes. If the disorder continues after this, a little ale with ginger may be given twice a day. When Epsom or Glauber's salt cannot be procured, common salt may be substituted for it, but it requires more dilution.

CHAPTER X.

MOOR ILL, WOOD-EVIL, CLUE-BOUND, FARDELL-BOUND, PANTAS, &c.

THESE disorders all belong to the same family, that is, weakness of the stomachs, or digestive system, brought on by feeding on unwholesome food during the winter, and accelerated or heightened by keeping the animals in a cold wet situation. In the low open country about Glastonbury, where bad hay is very plentiful, but ought to be good, these disorders are prevalent, and are known by a variety of names, among which is Moor-Ill, or Evil, because the country was formerly a moor or common, and very wet and exposed.

The drink No. 1. for *red water*, and a sheltered situation, are the best remedies: a few drenches of beer with ginger may afterwards be required, and then the animal should be kept in a sheltered field, where the grass is rather short but sweet. It is easy, however, to prevent these disorders, by making hay earlier than is now done; for there would then be better hay, and better after-grass. Farmers should also select the hardiest kind of stock for such situations, or breed their own, which is much better, because they would then be inured

to the climate. The desire now so prevalent for improving the breed of cattle and sheep, by crossing, and by change of climate, will, I fear, be productive of mischief. Sheep are greatly degenerated, and appear to be becoming weaker in their constitutions; and I think the same with regard to cattle. I have been informed that the following drench has been given with success in moor ill. Take one gallon of ale and boil in it a handful of wormwood until it is reduced to one quart; add to this six drams of long pepper powdered, and six drams of grains of paradise. The whole to be given at one dose.

CHAPTER XI.

CHRONIC RHEUMATISM, CHINE FELON, AND JOINT FELON.

These are diseases of the back or joints, attended with weakness and loss of flesh, brought on by feeding on bad hay or straw, and by the cold winds and the wet in the early part of spring. Let the beast be removed to a better situation; a sheltered field is the best; and if there is not sufficient grass, let there be bran mashes with a little malt, and a moderate quantity of good hay. The swollen joints should be well rubbed with neat's-foot oil, or the following embrocation; and the best drench that can be given is No. 1. prescribed for *red water*. Should it appear necessary, after this to give any thing more, let half a pint of good beer with a little ginger be given morning and evening.

Embrocation.

Sweet oil . . . . 4 oz.
Oil of turpentine . . . . 2 oz.—Mix.

CHAPTER XII.

JOINT YELLOWS, OR TAIL ROT.

THIS is a consumptive disorder, often a consequence of, or an attendant on, that stage of scouring or scantering which is named the scouring rot. It arises from the same cause as the preceding disorder, and can be remedied only by change of situation and food, a warm sheltered field; or in cold wet weather, a warm barton or cow-house, with straw to lie down in, and bran mashes with a little malt, and a moderate quantity of good hay. An opening drench is always the best medicine that can be given at first, and afterwards half a pint of beer morning and evening, with a little ginger. But if there is scouring, then the cordial astringent drench prescribed for that disorder must be given. The symptom which causes this disorder to be called tail rot, is an inability to lift the tail in dunging and making water, in consequence of which the tail and hind parts become very filthy, or covered with dung, by the lateral motion of the tail. There is also tenderness upon the loins and about the rump, and tightness of the skin covering those parts. From an opinion that there is a worm in the tail, which occasions all this mischief, cow-doctors make an incision of

two or three inches in that part of the tail where there is most weakness, or where the joint appears to be loosest. In a day or two the sore in the tail becomes painful, and induces the animal to make more exertion to move it about; and the warm stimulating drenches that are given, with the improvement in keep, sometimes strengthen the muscles, which moves the tail, and moderate or stop the scouring. This cure, which is seldom more than temporary, is attributed to the removal of a worm in the tail, which had no existence but in the imagination of the cow-doctor.

The only thing to be done when this symptom is observed, is to give the drench No. 1, prescribed for *red water*, and afterwards the cordial astringent drench, as directed for scouring; a sheltered field, or warm cow barton, or cow-house, according to the weather and season of the year, and a diet of bran mashes, with a little malt or gurgings, and a moderate quantity of the best hay, is all that can be done. It is to be regretted that proprietors of cattle should be so neglectful as they generally are of the means of preventing these disorders, and of curing them on their first appearance. The first process is by far the easiest, and most profitable: the second is generally successful; but if the disorder be not attended to at this period, the expensive drenches commonly resorted to may protract the fatal termination,

or produce a little improvement; and that is all they can do; nor can they do this unless the animal be placed in a proper situation, and allowed wholesome food.

CHAPTER XIII.

LOSS OF THE MILK, BAD MILK, AND DISEASES OF THE UDDER.

Having in the beginning of the book described the structure and economy of the digestive system, the reader will not be at a loss to account for the cow losing her milk, yielding bad milk, or for that disease of the udder, or rather of one of the quarters of the udder, which is commonly named *udder-ill*, when the digestive system, and especially the fourth stomach, is by any means disordered. This may happen not only from improper feeding, but also from a chill; that is, being exposed to cold and wet, or drinking freely of cold water when heated by exercise. It may happen also from the animal lying down in cold grass at the latter end of the year, when the nights are cold and foggy, and at a time when the stomach is loaded with food, and the blood vessels with blood, and when in consequence the brain is loaded, and the animal inclined to sleep. If the cow is in good condition, and especially if she breathes quickly and appears stupid, it will be proper to bleed; then the drench No. 1, for *red water*, is the best remedy, and afterwards short and sweet grass, where the animal may have sufficient

exercise in getting her food. This will gradually strengthen the stomachs, improve digestion and chylification, and purify the blood. The swollen udder, or rather that quarter of the udder which is affected (for there is seldom more than one affected at a time), should have the bad milk drawn from it three or four times a day, for by remaining in the quarter it would irritate and increase the inflammation. The only application necessary for the swollen udder, is neats'-foot oil, or olive oil, and when it is considerable, fomentation may also be made use of. If the swelling continues, and is not very tender, some of the following embrocation may be tried.

Embrocation.

Olive oil . . . . 3 ounces.
Oil of turpentine . . . . 1 ounce.
Camphor . . . . 2 drams.—Mix.

Cow-doctors generally use elder ointment, and ointment of althea, for this purpose; but these do not appear to differ from any simple grease or soft fat, in their medicinal properties. See Vol. II. on Veterinary Materia Medica.

CHAPTER XIV.

ABSCESS OF THE UDDER.

When the udder-ill is neglected, and especially when the bad milk is not drawn off, and improper medicine is given, pus, or matter, forms in the quarter, which, after some time, bursts. In this case, the wound sometimes gradually heals; at others, a fungus, or excrescence, sprouts from it, which is often of considerable size. This excrescence, however, if left to itself, gradually drops off, and remaining some time gradually heals. Sometimes the matter in the udder gradually drains off from, or accumulates in, the teat, which requires to be opened with a lancet. Another termination of this disorder is a gradual thickening, or hardening of the quarter, which ends in its total obliteration, and the recovery of the animal's health.

The most simple treatment is the best in this case. The cow should be kept at grass; and if there appears to be any disorder of the stomachs, the opening drench, No. 1, for *red water*, should be given. The udder may be kept clean, and that is all that is necessary, except a little oil, to keep off flies; and giving vent to the matter, by a lancet, from the udder or rather the teat, when it clearly appears to be necessary. The

opening should be made towards the lower part, where the matter appears to point, as it will then flow off freely. In some cases, the inflammation of the udder terminates in a hard indolent swelling, and the cavity, or milk cells, are obliterated.

CHAPTER XV.

FLATULENT CHOLIC, GRIPES, OR FRET.

In this disorder the animal is in great pain, often lying down and getting up again; she turns round her head to her hind parts, and endeavours to strike her belly with her horns, or hind leg. There is no appetite. I have seen this disease brought on by feeding on unbruised oats alone. The opening drench for *red water*, No. 1, was given, and the cow, which had been kept tied up, was turned to grass, she had some whey given her also, and a clyster of salt and water.

A considerable quantity of oats was brought off with her dung, nearly unchanged, and the disorder was completely removed.

CHAPTER XVI.

FEVERS, OR INFLAMMATORY DISORDERS.

In the introductory chapter it has been observed that inflammatory diseases generally take place during the spring and summer, and that they depend on repletion of the blood vessels, and can only be cured by early and copious bleeding, opening medicine, and putting the animal into short or bare pasture. It is not so essential, as it is commonly supposed to be, to give a long and minute description of all the appearances or symptoms, or, in other words, of the disorders which arise from this source, because the same treatment is applicable to all; still there is an advantage to be derived from making some division in this section of the work, especially as it will be thereby rendered more familiar, and better suited to a large proportion of those persons for whose use this book is designed; that is farmers and dairymen. It should always be recollected, however, that the blood of cattle is thinner or more watery than that of horses; especially when the latter are fed on hay and oats, or the nutritious roots, and the former are kept in wet, springy, quick growing pastures. The superfluous blood, therefore, or rather the superfluous water of the

blood, is more apt to pass off by the bowels and kidneys. Besides, in the horse we find a stronger nervous system, and consequently a higher degree of muscular power, and a large proportion of coagulable lymph or fibrine in his blood. His inflammatory diseases therefore require the most prompt and copious blooding, as described in Vol. I.; but in cattle we may often get rid of a slight inflammatory disorder, merely by some opening medicine, and a change of pasture.

CHAPTER XVII.

QUARTER-ILL, OR EVIL, BLACK QUARTER, BLOOD STRIKING, &c.

QUARTER-EVIL depends upon an excess of blood in the system; and that excess falling upon the muscles or flesh of the limbs or quarters, and ultimately suffocating the heart itself. In young cattle, for such are the subjects of this disease, the stomach, bowels, and kidneys, are of a firmer texture than in older cows; they are also in a state of growth; the excess of blood, therefore, is naturally directed to the muscular system, as the parts where it is most wanted. But when these become gorged, the disorder falls upon the heart, and the animal dies. The nature of this disease was clearly shown in a beautiful young Durham heifer which belonged to Lady Hippisley. She had been grazing in the park at Stone Easton, with seven others of the same breed; and was found ill early in the morning. I saw her about 3 or 4 in the afternoon, when it was clearly too late to do any good. The farrier had bled her and given some medicine; but she was unable to stand, and appeared in great pain. She died in the course of the night, and I went next morning to examine the body. On my arrival I was informed that another had been found ill early in the morning, and that she had been

taken to the dairy-yard, where the farrier had bled her, and given her some medicine. I went immediately to see her, and found one of the hind quarters very much swollen and inflamed; it was very hot and tender, and the animal appeared in great pain. Pulse about 120. I desired the farrier to bleed her with his largest size fleam, which was done, and when she had lost about a gallon of blood she fainted. We then left her to examine the dead heifer. The muscles of one of the hind quarters and of the loins were in many parts gorged with blood, apparently from a rupture of blood vessels, while in others they appeared quite pale, as if drained of their blood. But the most striking object was the heart, which was in the highest degree of inflammation. The lungs also were inflamed, or stuffed, if I may use the expression, with blood. From these appearances I expected to have found the brain in a similar state; but it was quite the reverse, scarcely a speck of blood could be seen. I now returned to the dairy yard to examine the other. She appeared much relieved, but the affected limb or quarter had become cold and insensible. Next morning she died, though so far relieved by the bleeding that she had drank some gruel at night. On opening her it was found that the disease had not extended beyond the quarter first affected, and that the heart was only slightly inflamed. At the time these yearlings were attacked with quarter-ill the weather had been very wet, and the nights were

extremely cold. If a young animal, whose stomach and blood-vessels are loaded, happen to lie down and sleep upon the cold, wet grass, there may be such a chilling impression made upon the skin as will cause the blood to recede from the surface of the body, and crowd about the heart and lungs. The first symptom in this case would be shivering and great depression of the nervous system. After a short time, however, the nervous system generally recovers from this torpor, and to restore the balance of the circulation the heart is excited to unusually strong contractions, by which the blood is propelled with great force from the centre toward the surface and the extremities, generally the quarters or loins. This is by no means an unfrequent occurrence in horses or in men; and though it may be called acute rheumatism, it is in fact inflammation of the muscles of the affected parts, which sometimes extends to the heart, and terminates fatally. When the heart has been thus excited to violent action, there is no other way of tranquillizing it than by a plentiful abstraction of blood; and the only criterion by which we can determine that a sufficient quantity has been taken is *fainting*. I have known the quarter-evil happen in winter, while the heifer was feeding on hay; that hay, however, was of the best quality, and she was liberally supplied with it. It is not unlikely, I think, that after heating herself by galloping about the fields, it being a

fine sunny day, though very hard frosty weather, she drank freely of a stream of water which runs through the field, and thus produced the chilling effect above described.

My Yorkshire correspondent, Mr. Sumner, says, "With regard to quarter-ill, I have seen it occur both in high and low land, and particularly when drinking turf-pit water, and at the same time in good pasture. A little while since I was sent for to see a two-year old heifer that had the quarter-evil in her thigh. I bled her freely, and gave her some opening medicine, punctured the swelling and blistered it freely. The drench was repeated; after an interval of 12 hours it operated well, and the heifer recovered. The last heifer I opened that died of quarter-evil, presented a somewhat different appearance from those before described. The heart, however, was highly inflamed, but the lungs were healthy. The fourth stomach was highly inflamed, numerous blood vessels (veins) appeared through the cuticular coat of the first, second, and third; and upon scraping off this coat, which separated very easily, I found the muscular coat much inflamed. The spleen (milt) was enlarged, tender, and gorged with dark-coloured blood. The veins of the brain rather loaded, and the brain itself softer than in the healthy state." Young cattle are most subject to this disorder, especially yearlings, and from that period till they are two years old. It may, however, occur after this, but with some-

what different symptoms. Spring and summer is the time when the disease makes its appearance, and it generally comes on suddenly. The young animal appears stupid and listless, hangs the head and ears, and has little or no appetite; a swelling takes place in some part of the body, as on the legs, shoulders, or on some part of the back. When these swellings are pressed, there is a crackling felt, as if air, with some fluid, were contained in them. The mouth and tongue are often blistered.

It requires but little reflection to be convinced that this disorder may, and always should be prevented, by not forcing young animals too much, but by keeping them in short or bare pasture. A common is the best situation for young growing animals. If they are kept in good pasture at that age, when the appetite and digestion are powerful, they should be carefully watched, and bled as soon as any of them appear dull and listless; but I am inclined to believe that if, when young animals are put into good pasture, they were limited in water, or even deprived of it altogether, they would be secure from the quarter-evil, and probably all other diseases. Writers on cattle medicine recommend drenches and bleeding as preventives of this disorder; and there may, perhaps, be those who will prefer this to the more simple and effectual method of keeping them in a proper situation.

CHAPTER XVIII.

INFLAMMATION OF THE BRAIN, PHRENZY, MAD STAGGERS.

THIS disease is known by a furious delirium, or madness, which generally comes on gradually, and should be noticed when approaching. It arises from an excess of blood, which first causes heaviness or stupor, hanging down the head, &c., which gradually increasing, becomes delirium, or madness. The eyes appear inflamed, and sometimes fierce. After furious exertions, the animal sometimes falls down, and lies for some time either senseless or struggling. After a time, it gets up again, and appears more quiet, but the paroxysm soon returns, and terminates in death.* If the approach of the disorder is observed, it may be stopped by copious bleeding, (See *Bleeding.*) A purging drench may also be given, and the animal should be turned into bare pasture. If he is not observed until the paroxysm, or delirium, has taken place, there will be some difficulty in bleeding him; when he is secured, if the arteries cannot be opened, both neck veins should be opened *as quickly* as

* Inflammation of the brain is sometimes brought on by the cruel and dangerous practice of driving cattle, until they become furious, through the streets of London.

possible; for by keeping the neck corded without opening the vein, we increase the quantity of blood in the vessels of the brain, and endanger their bursting.

No other remedies are required.

Purging Drench.

Take of Barbadoes aloes	from ...	$\frac{1}{2}$ oz. to 1 oz.
Carbonate of potash	from ...	2 ds. to 4 ds.
Glauber's salts	from ...	6 oz. to 8 oz.
Water		1 quart.-Mix.

CHAPTER XIX.

INFLAMMATION OF THE LUNGS, PERIPNEUMONY, AND PLEURISY.

A DISTINCTION has been usually made between pleurisy and peripneumony, the former being an inflammation of the pleura, or membrane, which covers the lungs, as well as the internal surface of the ribs, diaphragm, &c. (see Vol. I. *Anatomy of the Internal Organs*); the latter an inflammation of the substance of the lungs. This distinction is unnecessary; for wherever the inflammation begins, if it is not put a stop to by bleeding, it soon spreads. There is another disorder of the lungs, which consists in an inflammation of the membrane which lines the windpipe, and its innumerable branches. The name of this disorder is catarrh, or cold; and when existing in a higher degree, it has received a great variety of names, among which are, distemper, influenza, felon, &c. These high degrees of catarrh are attended by fever, and sometimes appear to be contagious. Inflammation of the lungs, whether pleuritic or peripneumonic, will form the subject of this chapter; catarrh, and catarrhal fever, will be treated of in that which follows.

Inflammation of the lungs is most commonly

brought on by driving cattle improperly when they are in good order, or fat. It is brought on also by keeping them too well, or feeding them too hastily. The symptoms are, quick breathing, which is seen by the quick motion of the flanks, dullness, and hanging of the head and ears, hot horns, especially towards the roots, nose hot and dry, loss of appetite, and quick pulse. (See *Pulse.*) Nothing but early and copious bleeding can possibly save the animal; after which he may be turned into a field where there is but little for him to eat, and where he can be sheltered from the heat of the sun, or from cold and rain; or when that cannot be done, he may be kept in a barton, or cow-house and fed sparingly on grass, bran mashes, whey, and only a small quantity of the best hay; and in this last situation it will be proper to give him the saline opening drench, that is, eight to twelve ounces of Glauber's or Epsom salt; and if that cannot be had, four or five ounces of common salt. He must be kept very low until the disorder is completely removed, and then he should be got up again very gradually.

CHAPTER XX.

CATARRH, COLD, CATARRHAL FEVER, DISTEMPER, EPIDEMIC CATARRH, AND INFLUENZA.

THIS disorder prevails most in the spring of the year, when the wind is easterly, and the weather wet and cold. It is caused also by sudden changes from heat to cold, or the contrary; drinking freely of cold water, after being heated by exercise, or by being driven. Sometimes it comes on without any perceptible cause, and sometimes prevails in such a degree as to appear to be contagious. It is then called influenza, or distemper. The symptoms are, cough, hanging of the head and ears, diminution or loss of appetite, and quick pulse; (See *Pulse.*) and the animal generally separates from its companions. After a short time there is generally a discharge from the nostrils, and sometimes soreness of the throat and difficulty of swallowing. When these are the symptoms, there is great debility, and loss of flesh. The disease sometimes degenerates into consumption, scouring, and atrophy. Copious bleeding is the first remedy. The animal should be placed in a sheltered field, or good cow-house, or barton. A field, however, is the best situation, if the weather is at all favourable. If the animal is

kept in a house, and there is no grass for it, bran mashes are the best food; and it will be proper to give six or eight ounces of Epsom salt in a quart of whey. If the disorder continues after this, small doses of nitre may be given in a little gruel. This disorder, though confined at first to the mucous membrane of the throat, nostrils, and windpipe, spreads to the whole substance of the lungs when improperly treated, or when the animal is exposed to wet and cold weather. The disease described in the preceding chapter originates in plethora, or fulness of the blood vessels, and increased action of the heart, in consequence of which too much blood is impelled into the vessels of the lungs. Catarrhal disorders depend more upon an impure state of the blood, occasioned by a suppression of those natural discharges by which the blood is depurated. These outlets being obstructed in some degree, the acrimonious humours are determined to the mucous membrane of the throat, nostrils, windpipe, and lungs, and sometimes to the mucous membrane of the bowels also. Bleeding is necessary to lessen the quantity of this impure blood, and thereby relieve the heart, and diminish its action, while the saline purgative determines the acrimonious humours to the bowels, and thereby relieves the lungs, which are of more importance, and more easily injured than the mucous membrane of the bowels. The nitre, which is di-

rected to be given afterwards, determines what remains of this noxious humour, to the kidneys, and causes it to flow off with the urine. In both cases, grass is the best food, and a sheltered field the best situation, when the weather is at all favourable; and when there is no grass, bran mashes, and a little of the best hay, are the best substitutes.

When catarrhal disorders prevail much, it is probable they are infectious; great care should therefore be taken in separating the sick from such as are healthy. Setons in the dewlap, and near the throat, may be employed when there is great difficulty in swallowing, or the throat may be blistered. When the difficulty and quickness of breathing continue after bleeding freely, the bleeding should be repeated, and the sides extensively blistered.

Blistering Liniment.

Powder of cantharides	1 ounce
Olive oil	6 ounces
Oil of turpentine	2 ounces.

Mix.

CHAPTER XXI.

INFLAMMATION OF THE STOMACH.

This is a serious disorder, and happens more frequently than people are aware of; it takes place however, in various degrees, causing a diversity of symptoms, but all of them bearing such a resemblance to each other, as will enable the practitioner to discover their origin. A certain degree of inflammation in this important organ will cause such an alteration in the milk, that when it arrives at the udder it will irritate and inflame it; and when the milk is drawn off, it will be found thin, yellowish, with small thread-like coagula, or, as it is termed, stringy. Sometimes it has an offensive smell, and even assumes the appearance of matter, and at others it has a reddish appearance, as if blood were mixed with it. (See *Diseases of the Udder.*)

Inflammation of the stomach may be produced by the animal taking too much food; in which case the digestive process is suspended, and then the food ferments, and a great quantity of air is extricated from it, which so distends the stomach as to inflame it. The bowel generally partakes of the inflammation.

This is different from the disease termed hoven, or blown, in which the rumen, or first

stomach, is the part affected; for here it is the fourth stomach. Unwholesome food is the most common cause, especially bad hay, but it also happens sometimes in summer, when the animal is in good pasture, and in cows that have been good milkers. The symptoms are heaviness, dullness, and want of appetite. The lungs are generally more or less affected, which is known by the breathing being disturbed, and sometimes by the hoose, or cough, which attends it. Bleeding until the animal appears faint is the first remedy, especially when it happens while she is in good pasture, and is fat, or in good order, and then a saline opening drench may be given, with the addition of a little castor-oil.

When the disease occurs while the animal is fed on hay, there is generally, perhaps always, a collection of the fibrous parts of the hay, in a dry and compressed state, between the leaves of the third stomach, which must be dislodged before any relief can be expected. The following opening drench, and a clyster, should be given for this purpose, and the cow should be turned out for exercise in a sheltered field, or barton, and be fed very sparingly. Whey, or thin bran mashes, are perhaps the best food. When the season of the year, or other circumstances, prevent her being turned into a field where the pasture is bare or short, she should always be allowed to drink freely, as that will assist in

clearing the third stomach; and when that has been accomplished, she may be kept better; but this must never be done hastily. Some time must be allowed for the digestive system to recover its tone or energy.

Saline oily Opening Drench.

Epsom salt	8 to 12 ounces
Carbonate of soda	$\frac{1}{2}$ ounce to 1 oz.
Water	1 quart
Castor or olive oil	4 to 6 or 8 ounces

Mix for one drench.

Opening Drench for Cows that are kept on Hay, or that have been recently taken from it.

Barbadoes aloes	$\frac{1}{2}$ ounce
Powdered ginger	1 to 2 drams
Water	1 quart
Epsom salt	6 ounces, or when this
is not at hand	4 ounces of common salt
Carbonate of soda	$\frac{1}{2}$ ounce
Tincture of opium	$\frac{1}{2}$ ounce, or anodyne car-
minative tincture ..	2 ounces

Mix for one drench.

From the foregoing observations it may be perceived that inflammation of the fourth or milk stomach may take place in various degrees, and under different circumstances; and some difference in the mode of treatment is therefore required. The state or condition of the animal,

the presence or absence of febrile symptoms, the age of the animal, the period of the disorder at which she is seen, the season of the year, and the situation in which she has been kept, are circumstances that must always be inquired into, and by which our treatment must be regulated; and in this there will be no difficulty, if we attend carefully to the principles or fundamental rules contained in the introductory chapter.

CHAPTER XXII.

INFLAMMATION OF THE HEART.

This disorder is almost always occasioned by over driving, when cattle are in good order, or fat, and especially when they have been stall-fed, and unaccustomed to exercise. It is generally attended with symptoms of inflamed lungs, and sometimes with pain in the bowels; in short, it may be considered as general inflammation. It is sometimes brought on by the animal drinking cold water when over driven or heated by exercise, but this is more likely to produce inflammation in the stomach and bowels. Copious bleeding, and keeping the animal cool and quiet, are the only remedies. The best food is thin bran mashes, or whey; and grass, when the animal is sufficiently recovered to be turned out. Two gallons of blood may sometimes be taken off in such cases; for the bleeding should always be continued until faintness is produced: and if the animal drops down from faintness, and continues so for some time, no danger need be apprehended, for whenever the disorder is curable, there is nothing else that can cure it. It has been stated in the chapter on Quarter Evil, that when yearlings die of this disease, the heart is found in a high degree of inflammation, and that nothing but copious and early bleeding is likely to cure it.

CHAPTER XXIII.

INFLAMMATION OF THE BOWELS.

THIS disorder in cattle is almost always a consequence of improper feeding, which causes indigestion and flatulency. The first symptoms are named *blasting*. And the beast is said to be *blasted*, that is, blown up, sometimes almost to suffocation, by the air which escapes from the undigested food.* The bowels are so distended, or stretched by the air confined in them, that they either burst, or a high degree of inflammation takes place, which terminates in mortification and death. I have known this disease happen from stall-feeding on potatoes, at a time when this vegetable was cheap, and on that account the farmer was so imprudent as to give the animal more than it was capable of digesting. Turning them too hastily into rich pasture will sometimes produce the same effect, and so indeed will the best kind of food when given too largely to an animal that has an inordinate appetite, which is sometimes the case with cattle, but more frequently with horses. (See vol. 1, or Compendium of the Veterinary Art.)

* See the article Hoven, Blown, or Blasting.

The symptoms vary more in the degree or violence with which the disease attacks, than in character. The animal appears to be uneasy, and loses appetite ; the body swells, and appears most prominent on the left side. The pain gradually increases, and the animal becomes more restless, often lying down, and soon rising again, she tries to strike her belly with her hind feet, or her horns. If relief is not afforded at this period, inflammation takes place in the bowels, or in the stomach and bowels, which is known by the pulse becoming quicker (see *Pulse*) ; the breathing more disturbed, and the pain more violent. This stage of the disorder is soon followed by death. The first remedy to be employed is the anodyne opening drench, that is, the drench No. 1, prescribed for *red water*, unless the breathing is much disturbed, and the attack violent, in which case the animal should be freely bled, as quickly as possible ; but in slighter attacks, the anodyne opening drench, and the opening clyster will generally be found sufficient. Still if the animal is in good order, it will be advisable as a precautionary measure, and especially if the horns are hot, and the vessels of the eye appear full. Clysters are a new remedy with cattle doctors, but they are useful, and cannot do any harm ; therefore, every proprietor should be provided with the means of administering them. (See *Clysters*.) The animal should be turned into a field, or

barton to exercise herself. I have seen this disorder produced by giving a cow unbruised oats. Grain for cattle should always be bruised, and mixed with cut straw, or grains.

CHAPTER XXIV.

INFLAMMATION OF THE KIDNEYS.

The *red water*, as it occurs in young stock, and working oxen, when put up into good pasture, or spring pasture, where artificial grasses abound, and are beginning to shoot, does not come strictly under this denomination, but is rather to be considered as arising from repletion of the blood vessels, and a previously relaxed state of the vessels of the kidneys. (See *Red Water*; see also Essay on ditto, Appendix.) Acute inflammation of the kidneys may be produced by blows on the loins, strains, or violent exertion, by one riding or ramping upon another. The most conspicuous symptom is a frequent desire to void urine, which is done with difficulty, and in small quantity. And instead of being transparent, and nearly limpid, it is bloody, or dark-coloured. Bleeding freely is the first remedy, and then the saline opening drench should be given. When the urine continues bloody, or of a red colour, after the pain and difficulty are gone off, and the animal voids it less frequently, and in larger quantity, the astringent drench should be given. The state of the bowels, however, should always be attended to, and costiveness avoided or removed when it takes place.

Saline Opening Drench.

Epsom, or Glauber's salts	6 to 8 ounces
Water	1 quart
Castor oil	4 to 6 ounces

Mix for once drench.

Astringent Drench.

Powdered Catechu	2 drams
Opium	½ dram
Alum	3 drams
Ginger	1 to 2 drams
Water	½ a pint.

Simmer the ingredients in the water for a few minutes; and when removed from the fire, add half a pint of good strong beer, or ale. This drench may be repeated if necessary.

CHAPTER XXV.

STOPPAGE OF WATER, RETENTION AND SUPPRESSION OF URINE, STRANGURY, &c.

Stoppage of water as it is commonly called, both in cattle and horses, often, perhaps generally, depends upon the stomachs and bowels being loaded, or blown up with air. In the cow, it is from the first stomach, or rumen, being loaded or blown up; in the horse it is generally the large bowels that are loaded; in both cases, the urine is stopped by the bladder being pressed downward, so that its neck rests upon the bones which form the brim of the pelvis, and is thereby completely closed. Pregnant cows, during the latter period of gestation, are subject to stoppage of urine, when tied up, and fed wholly on hay, and especially when fed too liberally on grains. Clysters are useful in this complaint, and the anodyne opening drench prescribed for *red water*, that is, the drench marked No. 1, or the following, when that drench cannot be had in time.

Common salt	4 ounces
Flour of mustard	a table-spoonful
Water	1 quart
Gin, one noggin, or	4 ounces

A little grated ginger may be added, and if no gin can be had, a pint of strong beer may be substituted. The clyster should never be omitted. (See *Clysters.*) There is no difficulty in passing the fore finger into the bladder of a cow or a mare, and letting the urine flow off.

CHAPTER XXVI.

INFLAMMATION OF THE WOMB, OR, CALF BED, PUERPERAL FEVER, MILK FEVER.

Many cows die of this disorder, which is produced either from being too fat at the time of calving, from having been fed improperly, from the calf having been disturbed in the womb, and having thereby its position changed, or from the force and violence employed in delivery. Difficult calving is so frequent in cows, that cattle doctors who have acquired a successful method of assisting them, or in drawing the calf, as it is termed, are considered very useful persons in a dairy district. Too often, however, they do considerable mischief by the force they employ, and especially if the cow is fat, or in good order. Not only inflammation of the womb is thus produced, but such exhaustion of the vital power, that the fever which follows quickly proves fatal. The only remedies to be employed are bleeding, a mild laxative, and a clyster. Cordials and anodynes are sometimes employed, such as ale, with a little toast in it, or some preparation of opium. There may be cases where the cow after calving appears languid and weak, and where such medicines are useful, by giving temporary energy to the system, and thereby hasten-

ing the expulsion of the after-birth; but whenever there is much fever, which is indicated by the quickness of the pulse, difficult breathing, pain, and want of appetite, cordials would be improper. Puerperal, or milk fever, is seldom cured, but may always, or almost always, be prevented, by keeping cows as much as can be in the field, and when it becomes necessary to give hay, to give such only as is of the best quality. It is advisable also to keep them in a situation where they can have shelter in wet and cold weather. Tying them up, and keeping them on bad hay, is certainly the source of the evil, but it should also be known, that exposure to the wet and cold of winter greatly depresses the vital power, and thereby diminishes the energy of the digestive system, rendering it less capable than it would otherwise be, of digesting the bad hay, or straw, that is often, or generally, given them in winter. Unwholesome water, such as is contained in ponds when there has been a continuance of dry weather, is one cause, I believe, of abortion, and probably of disturbing or altering the position of the calf in the womb. This probably depends more upon the quantity they generally drink of such water when not limited in food, or allowed to eat immoderately, than upon any peculiar quality in it. Mr. Sumner cured five out of six by bleeding freely, giving opening medicine and clysters, and covering the loins with sheep's-skin.

Inflammation of the Spleen or Milt.

This is a disease I had never seen when the first edition of this volume was published, nor have I ever met with a book in which it has been noticed, except one, and that is a work published in 1813, by Professor Volpi, clinical professor at the Veterinary College at Milan. He says, "that cattle are subject to a very acute kind of inflammation of the spleen, which generally destroys them in three or four days, though it is not of a contagious nature; for it does not attack other species of animals; nor can it be attributed to marsh miasmata, because it sometimes happens in very dry situations. We generally subdue this formidable disease by free and repeated bleeding; by giving nitre in a quantity of from 2 to 4 ounces a day; to which we may add 2 ounces of aloes and 6 ounces of Glauber's salt." (Compendio di Medicina Prattica Veterinaria di Gio. Battista Volpi. Professore di Clinica nella R. Scuola Veterinaria di Milano, &c. Vol. 1.)

This disease has often occurred in some rich meadows in Somersetshire, situated near a river, by which they are often inundated. The disease was first noticed about six years ago, during a long continuance of very hot and dry weather. It was then attributed to contagion, arising from the putrid carcase of a cow that had been

thrown into the river, and suffered to remain in a shallow place until it became very offensive. A great number of cows died that year, particularly on that farm near the place where the putrid body had remained, and the disease has been occurring from time to time ever since. In every cow that has died they have found the spleen very much enlarged; appearing as if it were bursting with very dark-coloured fluid blood. This was the only morbid appearance they had noticed, until I was desired to examine three cows that were then lying dead of the disorder. I found the spleen as they had described it, also that two or three pints of the dark fluid blood, with which the spleen was distended, had oozed through its investing membrane into the abdomen. The veins of the brain were loaded, and there was a small quantity of extravasated blood in one of the ventricles. One of them, a store cow, was slaughtered, and in her the heart and lungs were not much altered; but the brain and spleen were in the state before described. In the others the heart and lungs, as well as the spleen and the brain, were much inflamed. It is remarkable, that every animal which has been attacked by this disease has died, except one, and that one was bled until she became faint. Others have been bled, but never, as far as I know, to that extent. To avoid this disease, cattle should be brought gradually into such pastures, and driven out at night to some higher

situation, where there is only a moderate quantity of grass, and no water. As to the treatment of the disease, nothing I think can do any good except bleeding freely and purging.

CHAPTER XXVII.

SLIPPING CALF, SLINKING, ABORTION.

This is most probably occasioned by tying up cattle, and feeding them on bad hay, or stale grains, and should, therefore, be prevented by pursuing a better method. Feeding on unwholesome food, with want of exercise, occasions indigestion and flatulency, and this probably so disturbs the young calf in the uterus, as to cause either abortion, or such an alteration in its position, as renders delivery difficult, and often impracticable. When a cow slips calf, and any thing offensive is left in the field or barton, other pregnant cows smelling it are liable to meet with the same. Every thing that is of an offensive smell, especially putrid flesh or blood, should always be carefully removed. (See Essays, Appendix.) In Gloucestershire they suffer the cows to eat the after-birth, and it is supposed to be useful.

In the 6th vol. of Instructions et Observations sur les Maladies des Animaux Domestiques, by Chabert, Flandrin, and Huzard, there is an excellent paper on this subject, being the result of the observations of several eminent veterinary surgeons. From this it appears, that improper feeding is by far the most common

cause of abortion; and though impure water has been thought the cause, it is more probable, I am inclined to think, that it depends upon the large quantity of such water they drink, and the improper quantity of food they are thereby led to eat, than upon any peculiar quality in the water.

CHAPTER XXVIII.

LOCKED JAW.

This disorder in cattle, is generally the effect of wounds; and I have known one case which appeared to be produced by the animal breaking off one of the horns at the root. Plentiful bleeding is the first remedy; and if the jaws are not so completely closed, as to prevent a drench from being given, let the following remedy be administered, and its effect hastened by throwing up a clyster. The jaws, as well as the muscles of the neck, when they are affected, should be well rubbed with some warm liniment; and afterwards covered with fresh sheep's skin, the flesh side inwards. This will keep up a copious perspiration from the parts. Pouring cold water over the body has been recommended, that is, continuing to throw it over the animal, by means of a bucket. Should the disorder continue, one or two ounces of tincture of opium may be given, in beer, or brandy and water, and a solution of 3 or 4 drams of solid opium, in a quart of water, may be thrown up as a clyster.

CHAPTER XXIX.

WOUNDS.

The wounds of cattle are mostly inflicted by their goring each other with their horns, or by breaking over fences; and, when deep or extensive, are generally followed by considerable inflammation. The treatment of these wounds, though represented by farriers as an intricate and mysterious branch of the art, is, in fact, very simple. When the wound is considerable, and some important part has been injured, the irritating treatment commonly adopted generally destroys the animal, and in slighter wounds their stimulating applications are often improper. In deep or extensive wounds, especially of important parts, such as the belly, the chest, joints or tendons, the most effectual means must be quickly employed, to prevent a fatal inflammation. Bleeding freely, and the saline opening drench, are the first remedies to be employed, and afterwards emollient fomentations. When the inflammation has subsided, and the wound discharges good matter, a tent of digestive ointment may be introduced daily, that it may heal from the bottom. If the opening is small, and the matter has not free vent, it should be so enlarged that no hollow part may remain, or

none by which the matter may be confined. When a wound bleeds considerably, there is scarcely ever danger, but if it is thought necessary to stop it, the most effectual means is pressure. It is difficult to tie the artery, or vein, as surgeons do in the human body, and is often impracticable. When the belly has been wounded, and the bowels appear through the wound, they should be carefully put back again, and if there be any dirt about them, it should be washed off with warm water only. It may be necessary to throw down the animal in order to replace the gut, and it may be even necessary to enlarge the opening, or wound, for the purpose, through which the bowel has come out. The wound is then to be stitched up, but the stitches must be passed through the skin only, a bandage should then be applied as a further security. Punctured wounds about joints or tendons require the application of lunar caustic.

Stitching, or sewing up wounds, is not so useful as it is supposed to be: the wounds of cattle, as well as of horses, are generally attended with bruising and laceration, and if stitched up, the stitches always separate again in two or three days, and they sometimes cause much irritation and pain; when a flap of skin only is separated, the best plan is to cut it off.

CHAPTER XXX.

STRAINS AND BRUISES.

When these are considerable, bleeding is proper; and the best application is a fomentation of warm water, and some emollient ointment. In situations that will admit of it, an emollient poultice (see *Poultice*) is the best remedy. When the inflammation has subsided, the following embrocation may be applied.

Embrocation for Strains and Bruises.

Sweet oil	2 ounces
Oil of turpentine	1 ounce
Liquid ammonia	1 ounce.—Mix.

Digestive Ointment.

Take of hog's lard and common turpentine, of each 4 ounces. Melt them over the fire, and add powdered verdigris, or acetate of copper, finely powdered, 1 ounce. When removed from the fire, continue stirring until the ointment is cold.

CHAPTER XXXI.

FOUL IN THE FOOT, LOO, OR LOW.

THIS disorder most commonly occurs to oxen, or bulls, when fattening, or to cows that are fattening, especially when they are fed otherwise than on grass. It appears to arise from a bad state of the blood, and is similar to the foot rot in sheep, and the grease in horses. It consists in an inflammation, cracks, or soreness, and a discharge of stinking matter between the claws of the hoof, the matter bearing some resemblance to that which proceeds from the heels of horses, when labouring under the disease named grease. The common remedy for this is to rub some tar rope to and fro between the claws, so as to give considerable pain, and afterwards to dress the part with some mild caustic, such as spirit of salt. It will be found a better plan, however, after wiping the sore part with some tow, to wash it with a solution of blue vitriol, twice a day. If this does not succeed, something stronger may be used, such as a solution of two drams of sublimate in half a pint or twelve ounces of water. Egyptiacum has been recommended for the purpose, mixed with tincture of myrrh and turpentine. As the disorder proceeds from a bad state of the blood,

some medicine will be necessary, and if the inflammation is considerable, the animal should be freely bled. Stall-fed cattle labouring under this disorder should be turned to grass, which will greatly tend to the purification of the blood. This disorder sometimes attacks in a more violent form; is attended with a high degree of inflammation, and swelling just above the foot, or at the back part, or heel, the swelling sometimes extending all up the leg; and is accompanied with considerable fever. Copious bleeding, or until the animal becomes faint, is the best remedy in this case; and if sufficient blood can be taken from the toe, by means of a drawing knife, as in horses, it will more quickly afford relief. In one case the artery going to the claws was opened with good effect: it bled freely, and afforded more relief than was ever before observed. Bleeding from the toe, however, will be found more easy, and I think equally effectual. The best medicine to be given in this, as well as in the former kind, is the following saline purgative; and a field where the grass is not abundant is by far the best situation after the inflammation is abated. After bleeding at the toe, the whole foot should be wrapt in a large poultice, (see *Poultice,*) which should be renewed morning and evening, until the inflammation has subsided. Sometimes the swelling bursts, and a core comes out. When this has taken place, the poultice should still be continued for

a day or two, and then the wound may be dressed daily, with tincture of myrrh, solution of blue vitriol, or the following ointment.

Ointment for the Low.

Take of hog's lard and common turpentine, of each four ounces, melt together, and when removed from the fire, stir in of blue vitriol, *very finely powdered*, one ounce: continue stirring until the ointment is cold.

Violent inflammation sometimes takes place in the feet of cattle, from over exertion, or over driving, and requires the same treatment as the above, though more resembling the acute founder of horses in its nature; for it consists in a high degree of inflammation of the parts within the hoof, and is often attended, or preceded, by considerable fever. When the *low*, or foul in the foot, has been neglected, and becomes a chronic disorder, it is generally found difficult of cure. In such cases, it will generally be found that the cartilages, or bones of the foot, have become carious, or rotten, and then it is necessary to lay bare the carious bone, and scrape it with a suitable instrument; or, if it be the cartilage ligament, or gristle, that is affected, it should be dressed to the bottom, once with sublimate, and afterwards with solution of blue vitriol, tincture of myrrh, or Friar's balsam. This last stage of *low* resembles the canker of horses, and cannot be cured without laying bare

the diseased parts, or, in other words, without going to the bottom of the disorder, and thereby curing it radically. When this, or any other disorder, depends upon a bad state of the blood, from improper feeding, and want of exercise, it must be obvious that change of food and exercise are essential to the cure. I have known grains, and especially stale grains, cause this disorder in sheep; and there is no food which tends so much as grains to injure the blood of horses, and bring on mange, grease, and other cutaneous disorders. It is the same, no doubt, with other cattle, especially when allowed to feed freely on them, and it is astonishing what an appetite they acquire for them, or grains and malt dust, mixed with oats and chaff, after being accustomed to such diet. The best mode of purifying the blood is turning the animal to grass, and keeping him on it wholly. The best physic is the saline laxative, and afterwards small doses of nitre, or nitre and rosin mixed together. This keeps up an increased discharge of urine, with which the impure or excrementitious parts of the blood flow off.

CHAPTER XXXII.

SUPPLEMENTARY REMARKS ON THE DISEASES OF THE COW.

It has been justly observed, that writers on cattle medicine have all of them been fond of splitting diseases, and dividing one into half a dozen or more. It is just the same with local diseases, many of which may be comprehended under the three general heads of wounds and bruises, strains, and disorders of the skin; and these have already been considered. There are, however, some diseases which may be termed specific; of this kind is cow-pox, which, though considered as a local disorder, is really constitutional, and one of great importance. The only thing necessary to observe of the cow-pox here, is, that it requires no medical treatment, being a most benign disease, that always does well of itself. I cannot help, however, expressing my conviction, that if children were inoculated with lymph, from the vesicle on the cow's teat, at the proper period, it would be as effectual a security against small-pox, as small-pox inoculation itself, provided the child was healthy, or free from cutaneous complaints. And I am fully persuaded, that the failures of vaccination which are so often occurring, depend upon the un-

healthy state of the children to whose arms it is applied; that is, upon their having some eruption, or disease of the skin.

Angle Berries and Warts.

Cut them off with a pair of scissars or a knife. No dressing is afterwards necessary, except touching the part, after the bleeding has ceased, with a solution of blue vitriol. The more it bleeds the better.

Consumption, or Atrophy.

This disorder is incurable, unless it is taken early, and the animal kept in a good sheltered pasture. It is produced not only by cold, or moisture, as is commonly supposed, but also by bad keep. Some stock are tender and of weakly constitutions from their birth, and therefore, if placed in more exposed and much colder situations than those they are bred in, will be more liable to consumption, having less vital energy. But bad keep, especially bad hay and straw, is always the exciting cause. The chyle formed from such food becomes acrimonious, inflames, and obstructs the mesenteric glands, and produces a dreadful disease, even of the great mesenteric artery, which will be found full of worms. This is always the case, I believe, in consumptive disorders.

Nervous Disorders.

Such a disorder is noticed by writers on cattle medicine, especially by Downing, who prescribes for it an expensive drench, which cannot do any good, yet may be prevented from doing harm by the ale in which it is given. The diet he prescribes is not so objectionable, but good grass, or malt mashes with bran, is much better. The disorder he describes appears to be nothing more than a great degree of debility, into which these animals often fall, from the badness of the food on which they are kept, or from having many calves, and yielding a large quantity of milk for a considerable time.

Loss of Milk.

This is generally occasioned by an accumulation of food in the third stomach, and consequent derangement, or loss of power, in the fourth stomach. It may be removed by the opening drench of aloes, salt, whey, or water, and carminative tincture, prescribed in another chapter. (See Index, and Udder.)

Mange.

This disorder is less common in cows than in horses, and is brought on by keeping the animals on unwholesome food during the winter.

The itching the disease occasions makes them rub themselves against trees, or gates, until the hair is rubbed off, and the skin thickened, and drawn into folds about the shoulder, neck, or cheek, and sometimes on other parts of the body. The best situation for cows thus affected, is a field where the pasture is rather bare; and that, with a careful application of the following liniment, will soon cure the disorder.

Liniment for Mange.

Sulphur vivum, finely powdered and passed through a fine sieve	4 ounces
Train oil	12 ounces
Oil of turpentine	4 ounces

Mix.

N.B. Sulphur vivum is prescribed in preference to sublimate of sulphur, or flowers of sulphur, on account of its being cheaper, and, if finely powdered, equally effectual. Sublimate of sulphur, however, is certainly purer, and stronger, and, when expence is not regarded, should be preferred. Inveterate cases of mange may be found that will resist this remedy, but I believe very seldom, when it is properly applied, that is, well rubbed in with a hard brush, and the parts previously curried with an old curry-comb. One good application is generally sufficient. Should a case, however, occur, in which this remedy proves ineffectual, the following may be tried. Let all the diseased parts be

well washed with soap and water, and a hard brush, and all the soap carefully washed off. Then apply the following lotion.

Oxymuriate of mercury, (corrosive sublimate)	2 drams
Muriatic acid, (spirit of salt)	$\frac{1}{2}$ ounce
Water	12 to 16 oz.

Mix.

This lotion must be used only when the other has failed, and even then must not be applied extensively. I have lately seen an account in a newspaper of an action being brought against a farrier for the recovery of damages; some mangy cattle having died, after he had attempted to cure them by the use of a mercurial lotion, made with oxymuriate of mercury. (See vol. ii.)

Lice in Cattle.

Cattle that have been half starved during winter, by being kept on bad hay or straw, in cold, damp situations, are often covered with lice: these may be killed with a strong decoction, or infusion of tobacco, or with the mange ointment, prescribed in the preceding page. Improvement in keep is of course necessary, but they must not be put suddenly into good pasture, as they would then become liable to inflammatory disorders. By running on commons, or in pasture where they must work hard

for their living, the digestive organs acquire strength, and then better pasture may be allowed them without danger. A decoction of stavesacre will kill lice, or stavesacre finely powdered, and mixed with lard and train oil.

Warbles, Proof Worms, &c.

These are small tumours, which, in the spring and summer, appear in various parts of the body. They are occasioned by the bite of a species of gad-fly, which immediately after deposits an egg in the punctured part. This egg gradually becomes a maggot, or worm, which inflames the part, and causes matter to form. The maggot appears to be nourished by this matter, and when mature, or fit for another change, the small abscess which has served as an habitation for it, bursts, and discharges both the matter and the maggot; the latter soon becomes a fly, and in due time deposits eggs on the skin of the animal, like its parent. From this view of the subject, we are led to admire the provision which nature has made for the prevention of more dangerous disorders. The best thing to be done is to turn the animal into barer pasture, and leave the disease entirely to nature.

DISORDERS OF CALVES.

Calves are subject to several disorders during the time of sucking, of weaning, or while they are preparing or fattening for the butcher. These disorders, or rather symptoms, have obtained different names, such as cords, diarrhœa, costiveness, &c. But they are really only symptoms of one disorder, and that is indigestion. Calves sometimes are of a sickly or weak constitution, and require care as to the quantity of milk they take at a time; and if they exceed that quantity, their stomachs are disordered; and in consequence of this disorder, the acid which is always formed in their stomachs, for the purpose of effecting a change in the milk necessary to digestion, and the formation of chyle, is increased in quantity, and altered in quality. In consequence of this, the milk, instead of being changed gradually, and formed into very fine curds or flakes, is coagulated quickly, and large indigestible curds are formed from it. This produces almost all the diseases of calves. When the disorder has arrived at a certain height, the muscles are affected with spasms, and drawn into *cords*, as it is termed, that is, they contract with violence, and appear to feel knotted and hard in certain parts. Flatulency also takes place, and they become blown up, and affected with flatulent colic, which often terminates in inflammation and death. These

curds frequently remain in the stomach a considerable time, and I have seen them so compressed as to be absolutely formed into cheese, perfectly solid, and smelling like new cheese, a little sourish. Hence arise the obstinate costiveness, as well as the diarrhœa that sometimes takes place. Calves that are brought up by hand, even if they are not of delicate, weak constitutions, are liable to all these affections, merely from being fed improperly, that is, from having too much milk at a time, from that milk not being sufficiently fresh, or being in a bad state, in consequence of a disordered stomach in the cow, owing, almost always, to her being fed with bad hay, or stale grains. The reader must now recollect what has been said on the intimate connexion there is between the udder and the cow's stomach, and how liable the milk is to become altered in quality, as well as quantity, by feeding her upon bad hay. There is an acid formed in the stomach of the cow, and of all animals, when that organ is weakened in a certain degree, which, by irritating the fourth stomach, will disorder one or more of the quarters of the udder, and spoil the milk in that quarter. To cure those disorders is one thing, and will soon be described; to prevent them is another, and of much more importance. The mode of prevention is sufficiently obvious: but to cure them requires some trouble, and considerable care and attention. That symptom called the

cords, has at times proved very destructive, especially in Scotland, where there is but little grass, and a great deal of bad hay. The curative treatment will avail but little, unless the preventive treatment is also attended to, that is, unless the calf is supplied with wholesome food, and in suitable quantities. The following is the method to be pursued. The first thing to be done, is to correct the morbid acidity in the calf's stomach, and this can be done by the following medicine. Take a small knob of lime, about the size of an egg, such as will slake readily, put it into a jug that has a lip to it, and pour on it as much water as is necessary to slake it. This being done, pour on it one pint of boiling water, and having stirred it up a little, let it be covered up close. Then take a bottle that will contain eight ounces, put into it two ounces of subcarbonate of potash, commonly called salt of tartar, and fill up the bottle with the lime water, made as before directed, taking care to pour it off, not quite fine, but a little turbid; keep the bottle well corked, and mark it solution of potash.* This is the best thing that can be given for correcting the acidity of the stomach, and the quantity here directed will be sufficient for a great number of calves. It is necessary to give one or two tea-spoonfuls of

* A change of food is sometimes necessary until the stomach is sufficiently restored to digest milk.

this at first, with an ounce or two of Epsom salts, dissolved in eight ounces of thin gruel or warm water. This will carry off the curd that may have accumulated in the stomach, and at the same time destroy the acidity. If the disorder is accompanied with griping pains, it is necessary to give with it a tea-spoonful of tincture of opium, or a table-spoonful of brandy, or, what is better, a table-spoonful of the anodyne carminative tincture. This will soon relieve the griping pains, without preventing the operation of the laxative. When the calf has been thus relieved, it will be necessary to feed him carefully for a few days. If the bowels are loose, some gruel made of arrow-root, or fine wheaten flour should be given with a little of the solution of potash, or powdered chalk, in each feed. This should be left off gradually.

Hoose or Cough.

This disorder sometimes attacks calves, most commonly in winter, and is caused by very small worms being engendered in the branches of the windpipe. It is sometimes cured when attended to early, but if neglected at this period more commonly proves fatal. The remedy that has been found most successful, is a drench composed of a table-spoonful of oil of turpentine, a little sweet oil, with about six or eight ounces of warm water, poured into the nostrils. Pro-

bably the worms would be destroyed if the calf were made to breathe the vapour of oil of turpentine, or a mixture of turpentine and tar. I succeeded in one case that was rather recent and not severe, by giving two ounces of common salt dissolved in water, and giving a moderate quantity of good hay morning and evening. The cause probably is a cold and moist atmosphere, and an insufficient quantity of wholesome food.

Inflammatory Diseases.

Though indigestion, from improper feeding, is the cause of most of the disorders of calves, they sometimes thrive too quickly, or form so much blood, as to be attacked with inflammatory complaints. This is not often the case during the time they are fed on milk, but frequently when they are about one year old. Inflammatory disorders are denoted by heaviness, hanging of the head and ears, watery eyes, cough, loss of appetite, and sometimes quick breathing. Bleed freely, and give six or eight ounces of Epsom salts in water. When calves are about a year old, great care must be taken to prevent these inflammatory diseases, by keeping them in bare pasture. This is more effectual than all medicinal preventives. Thousands of calves have been destroyed by forcing them, as it is termed, at this period, that is, by keeping

them too well. Writers on cattle medicine have recommended drenches and bleeding when young stock are turned into good pasture, but how much better is it to keep them out of it? An operation has also been proposed, and practised with success, it is said, as a preventive of inflammatory diseases, and especially of that named *quarter ill* (See Quarter Ill), in young stock, or yearlings. This operation consists in making an incision in the skin between the claws, and taking up a bluish vessel that is found there. Probably the pain of the operation, and of the sores it produces, prevents the animal from feeding so greedily, or from thriving so fast as he otherwise would. It has been said, but I have not met with an instance of it, that calves, when first dropped, refuse the teat, and cannot be made to suck until some salt has been rubbed on their tongue to clear it of a glutinous mucus, which is the cause of their having no appetite. When this fails, it may be advisable to add an ounce or two of Epsom salts, with two drams of carbonate of soda, in a little whey or water. If they appear to be griped, a little anodyne carminative tincture may be given with the salts, and a little castor oil may be added. When calves appear to feed badly, and not to thrive, from half a pint to a pint of urine has been given with good effect. Probably a dose of salts would do better.

DISEASES OF SHEEP.

Sheep in their digestive organs, are very similar to the cow, except in being more tender, and liable to disorder, though naturally as hardy, it may be presumed, as other animals. The imaginary improvements that have been made in the breed have produced an alarming degeneracy in this race of animals. The few specimens of their lungs and livers, and probably the best only, that are shown at the butcher's stalls, and the incredible numbers sometimes swept off from a continuance of wet weather, are sufficient proofs of the truth of my assertion. The soil and climate in which the animal was produced is that which is most suitable for it, and in which it will always come to perfection, if it come from healthy parents.

I believe that a wet soil and moist atmosphere are generally the *exciting cause* of disease in sheep as in other cattle, and that debility of the nervous system is the predisposing cause; it must be obvious, however, that though the nervous system may become weakened in various ways, such as change of climate and soil, or negligence in breeding and rearing, yet the

situation above described may be sometimes the *predisposing* as well as the *exciting* cause. From this view of the subject it may fairly be asked, whether the more general and improved practice of draining which has of late years taken place, has not materially compensated for the evil before noticed, by drying the land, and consequently the atmosphere.

Hydrocephalus, Dropsy of the Brain, Giddiness, Goggles, Sturdy, Turnsick, &c.

This, as I have before observed, depends upon hydatids, that is, an animated semi-transparent bladder of water, with numerous small white opaque spots about its lower part, or neck, about the size of a pin's head, and which appear to be the germs of other hydatids. They are found in the lateral ventricles of the brain, in the substances of the cerebellum, and within the common sheath of the spinal marrow; generally in one cavity at a time, and seldom affecting the contiguous parts, unless the animal is suffered to live two or three months. They are most commonly found in the right ventricle of the brain, sometimes in the left ventricle, less frequently in the substance of

the lobe of the brain, or in the cerebellum, and still more rarely in the sheath of the spinal marrow. When the hydatid is in the right ventricle, and has grown to a sufficient size to affect the organs of sense by its pressure, it produces blindness in the left eye, and by this circumstance its situation may be always known. When increased in size sufficiently, it begins to operate upon the opposite ventricle in a greater degree than upon that which it inhabits. And this it does by bursting, and gradually forcing out its fluid through the septum lucidum into the left ventricle. Thus the right ventricle is somewhat relieved for a time, and the left becomes filled with water, and common hydrocephalus is thus produced in it. This left ventricle then becomes more diseased than the right one, and, by pressing on the left lobe of the cerebellum, will produce paralysis of the right side of the body. Thus we see a wonderful provision is made for sustaining the vitality of the muscular system, when one side of the body has become motionless from paralysis, there being a sufficient quantity of brain left in the right lobe, to sustain the vitality of the whole body. It is wonderful to observe, that after the hydatid has burst, and discharged its fluid into the left ventricle, the substance of the right lobe, which had been destroyed by its

pressure, is gradually regenerated, and I have found the whole lobe nearly restored, and apparently healthy. If the sheep is killed early in the year, the hydatid will be found in perfection, and the right lobe of the brain will be nearly destroyed by it. I have found the roof of the ventricle not more than the sixteenth of an inch in thickness. And the parietal bone above extremely thin, with a small opening in one part, near that part where the horn is formed and a little behind it. If a puncture be made through this opening, at this period, the water will gradually be discharged, and the animal will be cured.* Sheep labouring under hydrocephalus, or giddiness, have been considerably relieved by bleeding in the eye vein, or nostril; it would be still better, however, to bleed from the neck vein, as in horses and cows.

Two ounces of Glauber or Epsom salts may be given with good effect.

Bursting or Blasting, or the Blast.

This disorder is apt to occur when sheep are turned into clover, or any kind of pasture that

* This operation has been successfully performed in Dorsetshire.

induces them to feed too greedily. Many lambs are thus destroyed. I have been informed by an experienced farmer, that he had lost many lambs in this way; and he attributed it to their eating the young shoots of wild thyme in the spring of the year. When attacked with this disorder, they swell almost to suffocation, lie down with their legs stretched out, or stand still scarcely able to breathe, and soon die, unless relieved. Some farmers stab them on the left side, or flank, with a knife, and let out the confined air. The best method, however, is, to pass a probang down their throats, into the stomach, and give immediately after the following drench: they should then be moved about a little; and when relieved, they should be removed, and put into the barest pasture, where they should remain until the digestive system, or stomachs, are restored. (See Paunching and Probang.) A clyster also is useful. (See Clysters.)

Drench for Sheep.

Common salt	1 ounce
Solution of potash (as prescribed for the cords in calves)	1 or 2 tea-spoonfuls
Castor oil, or sweet oil ..	2 table-spoonfuls
Water	8 ounces

If the animal is griped, or in much pain, a little laudanum (30 or 40 drops) may be added, or a little anodyne carminative tincture (2 or 3 tea-spoonfuls).

Sheep sometimes hurt themselves by fighting or butting each other; in this case they should be bled freely from the neck. (See Bleeding).

Goggles.

This disorder is incurable, and is occasioned by water in the ventricles of the brain, and often in the sheath of the medulla oblongata. It is sometimes preceded by giddiness, and then depends on an hydatid, or animated bladder, in one of the ventricles of the brain, which bursts and discharges its water into the opposite ventricle, through the septum lucidum. (See Hydrocephalus.) This disorder, I am inclined to think, is of the same nature as giddiness, and depends on constitutional debility. It has been considered infectious, but is not so; the disposition or tendency to the disorder, may, however, be hereditary, and so may the disorder itself.

Goggles is distinguishable from gid or giddiness, by the sheep being more or less paralytic on one side. The disease runs its course more

quickly, and generally destroys the sheep in a short time. The affected animal is generally found alone, and its head mostly inclined to one side. It is often found in a dry ditch, or boring its head against a gate or hedge. The complaint is incurable. In one case of goggles I found the hydatid in the cerebellum.

Rot, Blaine, or Bain.

This disorder often occurs in sheep, and is thought to be hereditary, and it is as much so as any other disease in any animal. That is, the disposition or liability to the disease is hereditary, and that disposition to the disorder is nothing more than constitutional debility. This disposition, then, is a necessary condition to the formation of the disorder, and it will always take place when the exciting causes are applied, which are cold and moisture. Water meadows, therefore, are the most productive source of the rot in sheep. If the sheep are removed, when the disorder is observed to be coming on, to a more elevated situation, where there is good pasture, it will be apparently cured, and they will live as long as they are wanted to live.

Dr. Harrison has published an excellent de-

scription of this disorder. He observes, "when in warm, sultry, and rainy weather, sheep that are grazing on low and moist lands feed rapidly, and some of them die suddenly, there is fear that they have contracted the rot." This suspicion will be further increased, if a few weeks afterwards the sheep begin to shrink, and become flaccid about the loins. By pressure about the hips at this time, a crackling is perceptible; now, or soon afterwards, the countenance looks pale, and upon parting the fleece, the skin is found to have changed its vermillion tint for a pale red, and the wool is easily separated from the pelt (skin). As the disorder advances, the skin becomes dappled with yellow or black spots. About this time their eyes lose their lustre, and become white and pearly, from the red vessels on the tunica adnata and eyelids being contracted or entirely obliterated. To this succeed debility and emaciation, which increase continually until the sheep die; or else ascites, and perhaps general dropsy, supervenes before the fatal termination.

These symptoms are rendered more severe by an obstinate purging, which comes on at an uncertain period of the disorder. In the progress of the complaint, sheep become what the graziers call *chockered*, that is, affected with a swelling under the chin, which proceeds from a fluid in the cellular membrane under the throat. In five or six days after contracting the rot

the thin edge of the small lobe of the liver becomes of a transparent white, or bluish colour, and this spreads along the upper and lower sides, according to the severity of the complaint; sometimes it does not extend more than an inch above the margin. In severe cases, the whole peritonæum investing the liver is diseased, and then it commonly assumes an opaque colour, interspersed with red dark lines or patches. The upper part of the liver is sometimes speckled, like the body of a toad, to which it is thought to bear a striking resemblance; round the common bile duct and hepatic vessels, jelly-like matter is deposited, which varies according to the severity of the attack, from a table-spoonful, or less, to five or six times that quantity. Upon boiling, the liver loses its firmness, and separates into small pieces in the water, or remains soft and flaccid. Several graziers and butchers whom I have conversed with at different times, having observed that sheep are much disposed to feed during the first three or four weeks after being tainted, omit no opportunity of promoting it, with a view to increase their profits. When the first stage is over, flukes begin to appear in the *pori biliarii*, and common duct of the liver, and in the gall bladder. At first their number is small, but as the disease advances, they increase, and before death are often very numerous. In the last stage of the complaint, they are often to be found in the stomach, as well as in the

bowels and liver, and may produce either inflammation, or dropsy, or both these disorders. It sometimes goes off on change of pasture, and sometimes terminates in abscess, or in hard indolent tumours. When sheep have died of dropsy, it has sometimes been named *red water*, from the fluid collected in the abdomen being mixed with blood. This dropsy, however, is preceded by inflammatory symptoms. When rot produces abcesses in the liver, or lungs, the animal generally lingers for some time, and at last dies of atrophy, or consumption. The most common termination of the disease, according to Doctor Harrison, is in schirrus, or hard knots in the liver. Clater, in his Treatise on Cattle Medicine, says, he formerly published a remedy for this disorder, which succeeded in many flocks that he undertook the cure of, though they were in the last stage, and he had an opportunity of giving it a fair trial. He frequently succeeded (he states) in curing nine out of ten; yet does not inform us what this medicine was, but says the following recipe will be found of *infinite value!*

Recipe.

Nitre, in powder	6 ounces
Ginger, fresh powdered	4 ounces
Colcother of vitriol ..	2 ounces
Common salt	3 pounds and a half
Boiling water	3 gallons

"Stir them, and add to every quart of the mixture 3 ounces of spirit (oil) of turpentine, and bottle it for use. Keep the infected sheep from food all night, and on the following morning give each sheep 2 ounces of the above mixture, taking care to shake the bottle well immediately before it is poured off. To such as are weakly, give one half, or three-fourths the dose. Keep them from food three hours, after giving the medicine, and then turn them into a dry pasture. The drench is to be given every fourth day, for three times." Sheep take salt readily, and perhaps this, with change of situation, is the best remedy, as well as preservative. The dose of common salt is from half an ounce to 2 ounces; probably a small quantity given often, or the allowing them to take what they like, would be a better method of giving it, than giving a full dose at once. A mixture of tar, oil of turpentine, and sallad oil, has been found an excellent remedy for the rot. Four ounces of each of the first two ingredients to one pint of oil. Two table-spoonfuls of this mixture is a dose, which is to be given after fasting the animal all night. He is to be fasted also three hours after taking the medicine. The drench is to be given every second or third day for three times, and the sheep must be kept in dry pasture. The draining of land, which is now becoming so general, is likely, I think, to conduce materially to the preservation of the

health of sheep, as well as of all other kinds of cattle.

Foot Rot.

This disorder is analogous to the grease, the thrush, and the canker of the horse, and the *Loo*, or *Loe*, or *Foul in the Foot*, in cattle. It is produced by the same cause, as has been fully explained in the fifth edition of the third volume, under the article Grease, which the reader is requested to read.

According to this opinion, if a horse, affected with grease, is put into a sheep fold, he would be likely to infect the whole flock with foot rot. And a sheep affected with foot rot would do the same thing. This opinion, however, has not been fully established, and may admit of some doubt. The disorder, then, is supposed to be contagious, but may be produced also by other causes, and especially by keeping sheep in wet pastures, and placing them in such situations after their feet have been heated by travelling, or by improper feeding. The only method of curing it, is to examine the foot carefully, and pare away every bit of horn, under which the disease may have formed. When this is done effectually, and it is better to pare away too much than too little, a saturated solution of blue vitriol will generally effect a cure, especially if dissolved in vinegar;

but stronger applications are sometimes found necessary, such as spirit of salt, or a solution of red precipitate in nitrous acid, diluted with an equal quantity, or more of water. It is necessary also to avoid the cause that produces this disorder, by changing their situation, and giving them wholesome food. I have seen this disorder before any ulceration had taken place; it was observed by the sheep being very lame, and, on examining the foot, there was considerable inflammation in the skin between the claws, and immediately above. Lambs, as well as the ewes, were affected with it; so much so, that few of the two flocks I examined, were perfectly free from it. The disease appeared to be put a stop to for a time, by applying a solution of blue vitriol, but it returned again and again in several, and did not go off until they were fed wholly on grass. They had been fed during the winter, and the early part of spring, on grains, with a little hay, and what grass they could pick up. The grains were often sour, and they appeared to be remarkably fond of them in that state. Some of the sheep had a swelling of the sole of the foot, and great tenderness, as in the convex or pummice foot of horses. In many of them ulceration took place, and a separation of some of the horn. Should the solution of blue vitriol fail of curing the disease, some stronger remedy must be resorted to, such as spirit of salt (muriatic acid,) nitrous acid, butter of antimony, or red precipitate, dissolved in nitrous acid.

Flux, or Scouring in Sheep.

This disorder is a consequence of keeping sheep in cold and wet situations, and feeding them with bad hay. Change of situation, and proper food, that is, good hay or grass, is the first remedy. And if any medicine is given, it should be one fourth part of that prescribed for scouring cattle.

The Blood, or Blood Striking in Sheep.

This disorder is similar to the quarter-ill of young cattle. It takes place generally in rich and inclosed pastures, where close feeding is practised. It has been often experienced by the Leicestershire graziers from putting their sheep into clover. It is said, that a great number of sheep die of this disorder in Romney Marsh, in Kent; no less than four in a hundred, in some situations, where the soil is rich, and generally in spring, when the young shoots of grasses, and natural clover, are full of juices. In this state, they are eaten greedily, and often prove fatal, particularly after a warm day or two. On the approach of the disorder, they are observed to separate themselves from the flock, stand as if in pain, and look dull and heavy. They heave at the flanks, or pant, or rather breathe much quicker than usual. Sometimes they drop down dead in a short time; and

seldom recover, unless bled freely. They should be bled in the neck, like a horse or bullock, and not by cutting the ears or tail, or nostril, or opening the eye vein, as is commonly practised. After this they should be turned into bare pasture. If they appear to be costive, an ounce or two of Epsom salt, or an ounce of common salt, dissolved in water, may be given.

Braxy, Water Braxy, Dry Braxy, Bowel Sickness.

Water braxy is an inflammatory disorder, which quickly terminates in dropsy of the belly, or chest; dry braxy, is indigestion, or obstruction in the first and third stomach, by feeding during winter on dry sapless food, such as the tops of heather, bent, and other dry food. The symptoms of the former are quick breathing, hanging the head and ears, loss of appetite, and separating from the flock. In the latter, there is swelling of the belly, and griping pains, which often become violent. Sometimes the animal stands with its feet almost together; at others he is seen rising up and lying down nearly every minute. The mouth and tongue are dry and parched, and the white of the eye inflamed. In both diseases, bleed freely from the neck vein; and, in the latter, give one ounce of common salt, in half a pint of water, and a

tea-spoonful of tincture of opium; a dram of powdered aloes may be added, and a little ginger.

Scab.

This disorder is of the same nature as the mange in horses, and may be cured by the same means; that is, by rubbing upon the diseased parts, the following liniment: sulphur vivum, finely powdered or levigated, 4 ounces, train oil from 12 ounces to one pint, oil of turpentine, 4 ounces: mix well together. This liniment must be carefully applied, so as to reach the bottom of the sores, the scabs having been previously scraped off with a blunt knife, or any suitable instrument. It has been said, that mercurial ointment will cure this disease, but there is some danger in using it; I have known several sheep die, apparently in consequence of its having been applied. If a mercurial preparation could be employed with safety, I think that the nitrated mercurial ointment would be found most effectual.

Catarrhal Affections, Hoose, Cough, Distemper.

This disorder in sheep is similar to that in cattle, described in a former part of the book. It exists in various degrees, but the same remedy is always necessary, that is, bleeding to

the extent of one pint. If any medicine is required, it is half an ounce of common salt, or 1 ounce of Epsom salt, dissolved in 4 ounces of thin gruel. Sheep should never be bled in the nose or ears, as is commonly done. There is no difficulty whatever in bleeding sheep in the same manner that bullocks are bled, without cutting off a bit of wool. I was lately consulted for a large flock of sheep affected with this disorder, after between fifty and sixty had died. The proprietor had been bleeding in the nose and ears, and giving some absurd remedies. I prescribed the above treatment, and, by adopting it, the rest of the flock were saved. (See Bleeding.) There may be another kind of hoose, or rather chronic cough, to which sheep are subject, depending on small worms in the branches of the windpipe, as in the hoof of calves. This is more slow in its accession, probably, as well as in its progress, and is attended with a gradual wasting of the body. Not having met with a case of this kind, it must be left for future enquiry. With regard to the flock of sheep before noticed, where bleeding was practised with such success, the symptoms of the disease were clearly of an inflammatory nature, and this opinion was confirmed by an examination of the bodies of two that had just died of the disease. In both there was a high degree of inflammation of the heart and lungs, especially on the right side of these organs.

Worm in the Horn, or Frontal Sinuses.

This is very common in sheep, as much so in those without horns, as those that have them. They are deposited by the fly within the alæ, or flaps of the nostrils, from whence they gradually crawl up the septum nasi, or partition between the nostrils, which possesses less sensibility than the other parts within the nose; and, directed by this unerring guide, they arrive at the frontal sinus, which communicates with the bony cavity of the horn. These worms at times cause great irritation, and sometimes make the sheep almost distracted. When the worm has accomplished his purpose, he crawls out of his habitation, is thrown out upon the grass, and becomes a fly. The delirium which they sometimes occasion may be relieved by trepanning the frontal sinuses, which is a much better remedy that that commonly employed, of breaking the horn. The frontal sinuses are situated immediately above the eyes, towards the median line. Bleeding may afford some relief.

DISEASES OF LAMBS.

Lambs are subject to several diseases, which depend either on constitutional debility, exposure to cold and wet, especially the latter, improper food, and sudden changes of temperature, as in the early part of the spring, when the middle of the day is sometimes hot, and the night and morning excessively cold. Even when suckers they are liable to indigestion and flatulent colic, either from the unwholesome state of the ewe's milk, or from sucking more than their stomachs can bear. On examining the stomach of a lamb that died of indigestion, I have found hard curds, some of them so condensed as to have the form and the smell of new cheese. The unwholesome state of the ewe's milk appeared to arise from feeding on bad hay; for, as in cows, if the stomach is disordered or weakened, the milk will be more or less imperfect: grains, or other unnatural food, will probably produce the same effect. Cold and wet situations not only weaken the whole system, but more especially the digestive system, and thereby render bad hay, and other unwholesome food, more injurious than it would otherwise be.

DISEASES OF SWINE.

THESE are naturally omnivorous animals, but, by domestication, they may be made to live either on grass, grains, roots, or milk, or on animal food; but grain and roots, such as potatoes, are the best. They possess digestive organs of great strength, which are seldom diseased; although they sometimes appear ill, and without appetite, from gorging themselves with food, but soon get well, by being kept without, or turned into a field to graze. They are subject, however, to inflammatory and eruptive disorders, both which require bleeding, purgatives, cleanliness, and cold air. Cold bathing is often useful to them. I have known several pigs destroyed by feeding them with sweet whey; which has been thrown into a trough from which all the pigs were allowed to feed. One or more of them, has at times sucked in the whey so greedily, as to get a great deal more than his companions, and such a quantity, that fermentation has taken place, and so much air produced, as to blow up the stomach and bowels, and quickly destroy the animal. The best remedy is, to introduce a probang, as described for the relief of cattle that are blasted, hoven, or blown. (See Probang.) It should be of a small size, such as is used for blasted sheep; that is,

about one yard in length: when this cannot be had, the following drench may be given: solution of potash, as described for the cords in calves, 2 ounces, anodyne carminative tincture, 1 table-spoonful, or tincture of opium, or laudanum, 2 tea-spoonsful, water, 8 ounces: mix for one drench. Clysters of salt and water will be found of great use, and may be thrown up with the common bone clyster-pipe, and a calf's bladder, as for the human subject. When nothing else can be obtained, a solution of common salt, with a little ginger, or mustard, and a glass of gin may be given. It is much better, however, to prevent this disorder, by giving each pig a proper quantity only of sweet whey, or by not giving them any, until it has undergone some degree of fermentation, and become sourish. Such whey has never been known to produce the disorder. Pigs that appear off their appetite a little, and unthrifty, derive great benefit from taking one dram of powdered antimony every day in their food. Since writing the above, I have met with several cases in which it appeared, on examining the bodies after death, that there was an accumulation of hard dung in the bowels, and a considerable degree of inflammation of the lungs. From this, it appears, that after taking off as much blood as we can, an active purgative should be administered. They should afterwards be fed carefully.

Cutaneous Disorders, Eruptive Disorders, or Disorders of the Skin, Swine Pox, Measles, &c.

These diseases most frequently occur when many pigs are kept together, as at distilleries, and large breweries, and where they are fed principally on grains and such refuse as wash, which has undergone some degree of fermentation, and is possessed of an intoxicating quality. This is thought to dispose them to fatness; but it fills them with humours, and disposes them to eruptive diseases (such as measles, and swine pox) which become contagious, and sometimes very destructive. Whenever grains are given, whether to horses, cattle, or pigs, they should be fresh, and given with moderation, and should form only part of their diet. Sweet whey, as has been observed in the preceding chapter, has been the means of destroying many pigs, by blasting them, but, if given with moderation, and after being kept a short time, proves very wholesome food. Want of cleanliness, and want of fresh air, no doubt, conduce towards the production of eruptive diseases; but the food, I believe, is the material cause. These disorders, like the exanthemata of the human body, are often attended with fever of the inflammatory kind, which may be relieved by bleeding and purging; yet these are seldom effectual, unless assisted by cool air in an open field, and that is the situation the pigs should always be

placed in, for grass is on such occasions the best food they can take. After recovery, they should still be kept out, and if any other food than grass is given, it should be skimmed milk, with a little bran, or gurgins, or small quantities of whey. The remains of the eruptions may be removed, when the pig has acquired sufficient strength, by washing with soft soap and water, and turning him into a good bed of clean straw immediately after. The most easy method of bleeding pigs is by cutting off the tail, or part of the ear, by making an incision in the nose, or roof of the mouth, or by cutting them between the claws a little above the division.

Purging Powder for Pigs.

Jalap, 1 dram. Should this be found insufficient, 10 or 12 grains of scammony may be added, or 10 grains of calomel; but it is better, perhaps, to try the jalap alone first. It is difficult to drench a pig, but, if it can be done, a solution of Epsom salt may be given, with a little castor oil, or an infusion of senna; probably a solution of common salt would do, when there is nothing else, especially if a little oil be given with it.

DISEASES OF DOGS.

DISTEMPER.

This is a disorder which attacks young dogs at different ages, from two months old to the time of their completing their growth. Most commonly, I believe, it appears between the third and sixth month. It is an affection of the mucous membranes, highly inflammatory at its commencement, and succeeded by excessive debility. The symptoms vary considerably according to the parts where the disorder predominates. If the mucous membranes of the nose are affected, there is a discharge from the nostrils and eyes, frequent sneezing, great heaviness, and want of appetite. If the mucous membrane of the lungs be the principal seat of the disorder, there is a frequent cough, difficulty or quickness of breathing, discharge of frothy matter from the mouth, the cough exciting efforts to vomit, in which thin frothy mucus is thrown up. When these membranes, that is, of the lungs, and of the nose, are much affected, there is, at the same time, a considerable determination of blood to the vessels of the brain, occasioning comatose symptoms, such as heaviness and sleeping, or delirium and fits. When the mucous membrane of the stomach is principally affected, there is sickness and vomit-

ing of food, whether liquid or solid, as soon as it is taken in, attended generally with costiveness. And when the mucous membrane of the bowels is the seat of the disorder, there is diarrhœa, griping pains, and sometimes very severe fits. Through improper treatment those symptoms generally increase, and the animal sinks into an incurable state of debility. Some of stronger constitutions get over the shock, but are left in a state unfit for the sports of the field. I am inclined to believe, that there is only one certain remedy for this disorder, that is, copious bleeding at its commencement, and tying up the dog, giving him very little of the lightest food, such as gruel or broth, thickened with oatmeal, for a considerable time. This must be continued until the mucous membranes are restored to health, and then he must return to his usual diet and exercise as gradually as possible. I believe this mode of treatment is practised by very few. I was first informed of it 17 years ago, by a nobleman who then resided in the north of Devonshire, but I had at that time no opportunities of trying it. I have since heard that a farrier at Honiton practises it with uniform success, but he also gives some purging composition, of which aloes is the principal ingredient. I have since had an opportunity of trying it myself and found it successful. I bled the dog (a pointer puppy) until he fainted, and gave, a short time after, a few grains of antimo-

nial powder; probably James's fever powder would do better. We hear of many infallible recipes for this disorder, but seldom or never find them so on a *fair* trial. That I have recommended, if employed early and properly, is, I believe, the best. A seton in the neck is a good thing, especially when the eyes are much affected. The best method of preventing the distemper, or of rendering the attack less severe, is to keep the dog from too much animal food, and give him a little opening medicine when he is costive, such as jalap, or calomel, or both. When the eyes look red and dull, and the head heavy, this opening medicine is very useful. Young dogs, or puppies, should be kept from the water, especially such as are of tender constitutions. On examining several dogs that were affected with fits, weakness of the loins, or twitching of the fore leg, I have uniformly found the small bowels more or less inflamed; sometimes in a considerable degree. From the contents of the stomach and bowels, it also appeared, that they had been eating all sorts of trash, even straw, or horse dung. I have sometimes found the sheath of the spinal marrow inflamed.

Asthma.

Dogs are subject to a disorder similar to the asthma in the human subject, which is gene-

rally occasioned by an accumulation of fat about the heart, or by a frequent distension of the stomach by food, so that its capacity becomes increased, and a morbid or depraved appetite is the consequence. The only remedy for this complaint is abstinence, properly conducted, and feeding upon pure and easily digestible food, such as well boiled horse flesh, or other animal food, or such as has hung a sufficient time to become tender: oatmeal gruel, made with milk, is excellent food for an asthmatic dog. Some opening medicine may be occasionally required, for which purpose the following pill may be given:

Jalap and rhubarb, of each from 10 to 20 grains; ginger, 3 or 4 grains; soap, 10 grains; water enough to form them into a bolus. One dose. To be given on an empty stomach, and the dog kept without food for two or three hours afterwards. No other medicine is required. The disease is incurable, and can only be thus alleviated. Should this dose prove insufficient to open the bowels, add 3 or 4 grains of calomel.

Cholic, or Gripes.

Dogs are subject to griping pains of the bowels, almost always from costiveness. Clysters and castor oil are the best remedies. The oil, however, should be given in the dose of a

table-spoonful every hour, and the clysters repeated from time to time, until complete relief is afforded.

Cough.

Dogs are subject to a troublesome cough, which often excites a kind of vomiting, causing them to throw up a little frothy mucus. It arises entirely from indigestion; they should therefore be fed accordingly; and, if they run about loose, they should be muzzled. If they become costive, a tea-spoonful of salt, dissolved in a little milk and water, may be given, or the bolus prescribed in a former chapter. A strong solution of salt, given as a vomit, sometimes affords relief.

Diarrhœa, or Looseness.

This is always occasioned by improper feeding, and sometimes by a secretion of acrid bile. Tying up the dog without food for some time is a necessary remedy, and sometimes sufficient; if not, small doses of Epsom salt, dissolved in gruel, should be given. If attended with severe griping pains, about twenty drops of tincture of opium may be added.

Dropsy.

This disorder is incurable, but may be alleviated sometimes by a dose of calomel and jalap; after which small quantities of tender animal food may be given; and small doses of salt, which will act both upon the kidneys and bowels, and at the same time promote digestion. It may be given with their food in sufficient quantity only to make it palatable. Tapping may afford some relief, especially in encysted dropsy.

Fits.

These are generally a symptom of worms and obstructions in the bowels; they are often incurable, and can only be alleviated and kept in check by avoiding every thing which tends to determine too much blood to the brain. Costiveness, therefore, should be guarded against, and an abstemious diet is always proper. Violent exercise is very injurious, but such as is moderate is beneficial. A little opening medicine may be given occasionally.

WORMS.

I have met with different kinds of worms in dogs, but most commonly with the tape-worm, and another that I have named the ribbon-worm, from some resemblance it bears to a very narrow white ribbon, the tranverse threads of which are most conspicuous. On examining the worm, however, with a magnifying glass, these transverse lines appear as scales placed nearly perpendicularly, and inclining a little backward. One end of the worm has a bulbous appearance, and with this he attaches himself to the bowels; the other end is flat and square. I have lately had some of these worms brought to me that were voided by a man; he called them blood-worms, and from some that I have seen, it appears, that they do sometimes suck blood from the bowels; they may, therefore, be considered, perhaps, as a species of leech, and, as they have been seen in a stream of clear water, it is probable that they are taken into the stomach with the water the animal drinks.

This subject is one of importance; for I have discovered, that in a village, where I have occasionally resided, named Oak-hill, where all the water, with which the inhabitants are supplied, flows over the surface through fields—

that the inhabitants are very subject to worms, and several of them to tape-worms, and that many of their domestic animals are infested with this small species of leech-worm. I have known long tape-worms brought off from several of the inhabitants, and have found the small leech-worm after death, in the small intestines of their domestic animals; even in the dog and the cat. Horses I find, especially when affected with mesenteric consumption, have generally got them. The longest leech-worms are those found in the bowels of the dog and the cat, where they are well supplied with chyle, though the habitation is much smaller. In the consumptive horse they are generally small, and I have seen them literally starved, and full of grumous blood. I should not have noticed the circumstance of the inhabitants of this village, and their domestic animals, being infested with this kind of worm, had they not possessed a convenient spring of excellent water at a short distance, where, perhaps, they may get supplied with little trouble, and often, perhaps, with salutary exercise. It is remarkable that I never met with this worm until I resided in Somersetshire, and that since that time, I have often seen them at the kennels, and other places, especially in the miserable animals employed in carrying coals from the pits, to the neighbouring towns and villages. These animals are generally in the most wretched condition, and pick up their

living, for the most part, from the road side, or from the hedges and ditches.

Recipes for Worms.

Take of oil of turpentine, half an ounce, pour it into the throat carefully, and give, three or four hours afterwards, one ounce of castor oil: oil of turpentine may be given mixed with castor oil, to dogs of delicate constitutions, or that appear to have weak stomachs. Filings or fine scrapings of pewter have been found to destroy worms in dogs,—the dose should be about as much as will lie on a shilling:—calomel and jalap will expel worms from the bowels, especially if a little Ethiop's mineral, about a dram, be given for three or four mornings or evenings previously.

Mange.

This disorder is very common in dogs, and may generally be cured by rubbing in the following liniment, keeping them on a wholesome diet, chiefly of vegetable food, and giving them now and then a little opening medicine. The mange is known by the dog almost constantly scratching himself, and by the skin appearing moist, and sometimes scabby. The dog should be well scrubbed with soft soap and water, or tobacco water, and well wiped with a dry cloth immediately after. When quite dry, apply the

mange liniment, taking care to rub it well on every part. There is an obstinate kind of mange, in which the skin appears of a bright red colour, and sometimes scabby also. Here some internal remedies are required of the alterative kind, such as Ethiop's mineral, calomel, or even very small doses of sublimate, (from 1-8th to 1-4th of a grain.) Mange is sometimes extremely obstinate, and terminates in dropsy or consumption. I have lately found it a good plan to give the following powder every morning and evening, for a few days, before the liniment is rubbed in. Ethiop's mineral, and levigated antimony, of each 20 grains, mix for one dose.

Mange Liniment.

Sublimed sulphur	1 ounce
Train oil	4 ounces
Oil of turpentine	1 ounce.—Mix.

Stir the mixture well before it is used, and while applying it.

Diseases of the Eyes.

Dogs are subject to inflammation of the eyes, which is generally caused by eating too much animal food, and by violent exertion. A purgative of jalap and calomel should be given, and after that the dog should be kept on a spare diet. Eye washes, such as a weak solution of

acetate of lead, of zinc, or sulphate of zinc, may also be employed in such cases. Old dogs sometimes become blear-eyed, and then a little vinous tincture of opium, or brandy and water, is a good wash for them, or one dram of white vitriol dissolved in half a pint, or twelve ounces of water.

Strains.

Dogs are sometimes strained, but it is an accident that does not occur frequently. Whenever it does, the dog should be bled, have a little opening medicine, and then remain tied up, until he is perfectly recovered. If any part of the hind or fore leg is inflamed and swollen, it should be fomented frequently. A low diet is proper. When strains have been neglected, and callous swellings have formed, in consequence, about the joint, I have seen firing do good; it should therefore be tried. The firing iron must be used with much care upon this animal, for the skin, which is very thin, should never be penetrated.

Costiveness.

This disease is very common to old dogs. Clysters are very useful, and the best purgative for them is calomel and jalap. Bones are bad

food for them; oatmeal gruel with milk is the best food.

Inflammation of the Bowels.

This disorder generally depends on costiveness and flatulency. The dog should be bled largely, and clystered; and if the griping pains are severe, about twenty drops of tincture of opium should be given, with about one ounce of castor oil; the dose must be repeated once or twice, if necessary, and the clyster several times.

Sore Claws.

The best remedy is a poultice, or bathing them well with an old dish-clout, in warm greasy water. Afterwards the dog should be tied up until quite well, and take a purgative of jalap and calomel. If the disease does not submit to this treatment, wash the part with a solution of blue vitriol, 2 drams to 6 or 8 ounces of water.

Inflamed Lungs.

This disorder is known by very quick breathing, hot and dry nose, redness of the eyes, and loss of appetite. The dog should be bled until he becomes faint; afterwards, a dose of calomel

and jalap should be given, unless there are also griping pains and costiveness, then castor oil and clysters will be proper. If this does not afford relief, rub some blistering liniment into the sides.

Inflamed Stomach.

In this disorder the dog is constantly vomiting, especially after taking food, whether solid or liquid. Bleeding and abstinence are the only remedies. It is often followed by diarrhœa, which never should be suppressed by opium. Arrow-root gruel will serve both as food and as a remedy. If it causes vomiting, no more should be given; abstinence, in that case, is the only remedy.

Injuries of the Mouth from swallowing Bones.

Dogs that feed much on bones, especially hard bones, are apt to have them stick about the mouth, and the jaw bones are sometimes considerably and incurably injured in this way. The means of prevention in this case are obvious, and should be attended to. When a bone is sticking in the mouth, it sometimes causes efforts to vomit, and the dog will be seen making ineffectual efforts with his paw to remove it. The easiest way of removing it, is by the fingers, or a pair of forceps. When caries of the jaw bone has

been thus produced, the diseased bone should be scraped with a small drawing knife, or other suitable instrument, and then a little tincture of myrrh should be applied, or a solution of alum, by means of a little lint wrapped round the end of a probe.

On the Training of Sporting Dogs.

I have often thought that if training, or a suitable preparation has been found essentially necessary for horses employed in hunting and racing, it is but reasonable to presume that it must be useful, if not essentially necessary, for dogs that are used for the sports of the field. In kennels where fox-hounds or harriers are kept, there is always one regular system observed with regard to feeding, exercise, and cleanliness; and as there are generally two men employed in a kennel where a large pack is kept, and these subject to the frequent inspection of the huntsman, any error that may occur is quickly discovered, and a suitable remedy provided. Besides, hounds, and especially fox-hounds, are of hardier constitutions than other dogs; whether this arises from the care that is taken in breeding, the country air in which the puppies are reared, or to the systematic management of she kennel, or to their being naturally a hardier race, it is difficult perhaps

to determine. Hounds have certainly one advantage over the pointer, which is, that their employment is for the most part in cold weather, while that of the pointer often begins when the weather is very hot. I have been led to introduce these observations from having just seen a letter on the diet of the pointer in the Sporting Magazine, No. 76, New Series. It is signed Auceps, and proves that the writer is not only an experienced sportsman, but one of accurate observation and sound judgment. As it is but short, I shall take the liberty of transcribing it.

"If condition be necessary to the fox-hound and others of the canine species, whose services are required in the cooler months, and no dog can be in real condition without regard to diet; is it not indispensably so in an animal called on for the utmost exertion of his power, commonly under a burning sun, and even when the leaf of the aspen tree is void of motion? Yet, how often is the pointer taken into the field, even at the commencement of the season, either too low and too weak for work, or as is, I think, more frequently the case, so full of flesh as to be incapable of action without visible distress! Servants are apt to think, that they recommend themselves by keeping pointers, as well as other dogs entrusted solely to their care and management, plump and sleek; so that, reversing the adage as applied to the

horse, '*it is* (*often*) *the master's eye that makes the dog thin.*' Independent, however, of the season of the year, and the effects of the atmosphere, to call forth the best powers of the animal more attention is required to the feeding of pointers than most other sporting dogs. These creatures are particularly, nay, proverbially, ravenous; and as they require indeed more nourishment than most other dogs of their size, it is sometimes a difficult matter to regulate them in this respect. Gormandisers, as nine out of ten of them are, there is nevertheless a great constitutional difference in them. Giving to some no more food than may have been ascertained as conducive to condition, to a bystander unacquainted with the cases respectively, would appear cruelty, nay, downright starvation. Looking, however, to the result of things, under-feeding, as is the case with other dogs also, is much more advisable than over-feeding. No pointer can carry too little flesh, in the hotter part of the season especially, provided he retains his strength and spirits: and, in order that he may have that little flesh firm and good, the due nourishment given him should be in as small a compass as possible; and to complete him as to his wind, that golden rule should be observed, *a little and often.* From the sole consideration of their tendency to create heat, horse-flesh for the greater part, or barley meal as a chief ingredient, however

advisable in more modified proportions in the cooler months, constitute the worst food for a pointer in September and the beginning of October. Milk and bread, whether regarding nose or continuance, appear from experience, not of myself only, but of many of the keenest shots, to be the best diet at the commencement of the season. Potatoes make the best succedaneum for bread, and are inferior to it only from the nourishment they afford being less condensed, or, in other words, occupying more room in the stomach. Having thus advised as to diet, I have to recommend, in order to the promotion of the best exertions of the animal, that a month before the commencement, and during the earlier part, of the season, at all other periods than during his exercise, the pointer be invariably tied to a moveable box, in an airy situation. The range of a pointer loosed from confinement is commonly far above that of one which is a stranger to restraint. Considering the ardour of shooters, and especially in the earlier period for sporting—considering also the care that is taken as to *breeding* and *breaking*,—it is surprising that so little notice is taken of what mainly conduces to their grand object, inattention to feeding being a chief reason why, of fifty pointers brought into the field, at the commencement of the season especially, scarcely one in a hundred is what he ought to be. (Signed) AUCEPS."

On the Yellows.

This disorder sometimes occurs in kennels, and is known, not only by a yellow tinge of the dog's eyes and mouth, but by being accompanied also by languor, sluggishness, loss of appetite, and costiveness. The remedies are bleeding, a dose of physic, composed of ten grains of jalap, four of scammony, and two or three of calomel. If this does not operate in the usual time, give a table-spoonful or two of castor oil, and continue every three or four hours, until the bowels are sufficiently opened. After this the dog must be fed sparingly for some days, and then brought gradually to his usual diet. Exercise will hasten the operation of physic, but he must be carefully kept from cold water.

DISEASES OF POULTRY.

THE disease most worth noticing in poultry is one which sometimes affects turkeys, and by which a great number are at times destroyed. The nature of this disorder I believe is not known. I have found nothing in the body of the bird to account for it. Worms are sometimes found in the windpipes of turkeys. These worms appear to be generated within the windpipe and its branches, as they sometimes are in calves and asses, and sometimes, but more rarely , in horses. These are all the diseases of poultry that I am acquainted with, except such as are produced by improper feeding; in all which cases, the means of prevention and cure are sufficiently obvious. The climate or temperature in which they are kept should always be suited to the nature or strength of their constitutions. I have known a turkey feed so greedily on peas, that he was nearly suffocated, and must soon have died, had not an opening been made in his crop with a penknife, and the peas taken out. The crop was sewed up again, and the bird perfectly recovered. Attention to feeding, and the state of the digestive organs, will be found as advantageous in poultry as it is in other domestic animals. It is probable that opening

medicine would sometimes be of use to them; but what would best answer this purpose, or what mode of feeding is most profitable, can be determined only by experience. Grass, perhaps, is a good purgative, and bruised or powdered grain better than whole grain. Cooping may be found at times rather an impediment to fattening, especially in birds that have been accustomed to liberty. Solitude may also be injurious: cheerfulness in all animals contributes much towards healthy digestion; therefore, even poultry should be treated with kindness, and their comfort should be attended to. I have seen ducks and fowls so affected with palsy, that they were incapable of standing. This has been attributed in some instances to the gravel they had swallowed, having been brought from a place near the lead mines. Certain it is, that a great number of poultry, as well as other animals, have been at times destroyed in the parish of Wookey, near Wells, after heavy rains had caused the brook which runs through the village to overflow its banks; and that the lead mines on Mendip are in some way or other the cause of the mischief. (See Essay VIII. on Mindering.) But I have seen it happen in situations where there was no reason to suppose that lead ore, or any preparation of lead, had been swallowed. In two that I have opened, I found gravel of an unusually large size in the

gizzard, and some of it beautifully polished, appearing as if it had been there some time. I have known poultry relieved, and even cured, when labouring under some internal disorder, by taking two or three pepper corns.

GENERAL OBSERVATIONS ON FATTENING CATTLE, AND OTHER DOMESTIC ANIMALS USED AS FOOD.

It is considered as an established fact, that cattle of a certain form will fatten more readily than others; and the form most desirable is a wide, deep, and capacious chest, small head and legs, the tail fine, and going off nearly in a line with the back. There are other points well known to butchers and graziers, but not easily described. The capacious chest is favourable to easy breathing, and easy breathing is thought to conduce towards easy digestion; and it is almost superfluous to observe, that the nearer the digestive process approaches to perfection, the more speedily will the animal become fat. A disposition to fatness may be greater in some breeds than in others, but it is reasonable to infer, if we are allowed to depart at all from the path of experience or actual trial, that breeding from healthy parents is a circumstance of the greatest importance, and the first step towards improvement in breeding and grazing. In breeding milch cows, it is known to be of importance to cultivate the temper or disposition; for it has been found that cows of a quiet, gentle temper, produce more milk, and yield it more readily, than such as are of a contrary disposition, supposing them to be alike in all

other circumstances. The quantity and quality of the milk must depend much upon the facility and perfection with which the food is digested. When the cow is suffered to go dry, instead of milk, we have an increase of muscle, or flesh and fat, and of all other parts, but chiefly of the two former, and especially the second.

Quietness of temper, then, may be considered as a desirable circumstance in animals designed for grazing. In cultivating the temper, we cannot begin too early, and, by so doing, we render young steers more docile and tractable, when wanted for the plough or other labour. This good disposition should be carefully cherished, while they are employed in the labours of agriculture, by kind and humane treatment. Such management will enable them to do their work better, and with more ease; they will also be less liable to disease, and their food will do them more good, and give them more muscular power. When put up for grazing, they will be found to fatten more quickly than such as are of a different temper or disposition. When the disposition of young steers that are wanted for the plough is found to be bad and troublesome, they should be corrected with care. The most patient and steady men will be found most capable. It was well observed by Lord Pembroke, in his excellent work on Military Equitation, and Breaking of Horses, that whenever he saw a rider in a passion with his horse,

he was sure to find him more to blame than the animal. It is astonishing what advantage is obtained by attending to the disposition of colts, even from the time of weaning. It must be admitted that there is a great difference in the natural disposition of animals; but gentleness and docility are in a considerable degree hereditary, which is a circumstance that should always be attended to in breeding. It may be safely laid down as a general rule, that a man of a hasty, impatient, or passionate temper is an unfit person to correct the temper of young animals; a man of a cruel disposition is still more unfit. Such an employment requires patience, evenness of temper, and perseverance. As to the food most profitable for fattening cattle, there cannot be a doubt, I believe, that grass is the best, provided they are not put too hastily into rich pasture; inattention to this circumstance, or, as it is termed, forcing cattle too much, is the cause of serious disorders. The practice of tying up or stalling working cattle is bad; they are hardier, and have more muscular power, when suffered to exercise themselves and pick up a little green food in the fields. It is a false or mistaken economy to keep them on unwholesome food, such as bad hay; it reduces their muscular power, and does considerable injury to their digestive organs. Next to good grass, good hay is the best food for them; that is, hay that has been made early, is of a light

green colour, fragrant, and full of herbage. Hay that has been made late, is stalky, dry, and fibrous, is greatly deficient in nutriment, and difficult of digestion. That which has been soaked by the rain has had most of its nutritive juices washed out of it, and what is left consists, in a great measure, of indigestible fibres. Hard stalky hay that abounds in docks and thistles is apt to injure the gums and grinding teeth, and thereby render rumination painful and difficult, and consequently imperfect. When young stock are put up for fattening, it is of importance that they should be healthy, and especially that the digestive organs should be so. When they are otherwise, the best thing to be done is to turn them into a bare, but sweet pasture, and keep them there a considerable time. The stomachs will then acquire strength, and the digestive power will be restored. With regard to stall feeding, it is a subject that requires careful consideration, and I think it likely that the method often adopted will admit of improvement. I have known several beasts destroyed by feeding on potatoes, at a time when potatoes were remarkably cheap, and, on that account, given too freely. Bad or indifferent hay should never be given. Oats should always be bruised; when given otherwise, and especially when given alone, they are difficult of rumination and digestion, and I have seen them prove quite indigestible, and productive of a serious disorder,

which required the opening drench, No. 1, for *red water*, and a clyster of salt and water. In two cases the oats were discharged by means of the opening drench, almost unchanged, and not soft and swollen as they are often found in the dung of horses. After this, the cows quickly recovered. Previously to fattening a milch cow, she should be kept for a considerable time in bare pasture, after which she will fatten more readily than she otherwise would, and be much better meat. When cattle are stall-fed, it would be a good plan to give them an opening drench occasionally, and if they appear dull and heavy about the eye, some blood should be taken off. A little exercise now and then would promote digestion, and tend to the preservation of health. Habit, however, has great influence in reconciling animals to such confinement, and they are not so often hurt by it as may be expected. Habit has the same influence in reconciling the stomach to potatoes, bruised beans, and other food, which, unless given at first sparingly, and with care, would prove very injurious. The best opening drench is 4 ounces of common salt, half an ounce of aloes, 2 drams of ginger, half a pint of ale, and a pint and a half of water; to which about 2 or 3 drams of soda would be an useful addition. In fattening calves from the pail, the milk cannot be too fresh; for it becomes less easy of digestion, and less nutritious, in proportion to the time it is kept. When the milk

cannot be had quite fresh, or when the calf seems indisposed and loose in the bowels, a little powdered chalk may be added to it. Too much milk is sometimes given at a time, by which the stomach is oppressed, and digestion interrupted. A little abstinence is useful on such occasions, and the following opening drench: common salt, half an ounce to 1 ounce; aloes, 1 dram; soda, 1 dram; ginger, half a dram; water, half a pint; gin, a table-spoonful. (See *Diseases of Calves.*)

I have seen lambs fattened in December, by keeping several of them together within doors, and bringing the ewes to them to be sucked morning and evening, or three times a day. In the intermediate time they had placed before them small troughs containing barley or oat-meal, mixed with a little powdered chalk. They were thus fattened in a short time, and made excellent meat. The ewes should be allowed the very best hay, with the best grass they can get.

In fattening pigs there does not appear to be much difficulty, and the only thing thought necessary is to give them as much food as they can eat. It is as necessary, however, in this, as in other animals, to keep the stomach in a healthy state, for if this vital organ is disordered, the most nourishing food will do them no good. (See *Diseases of Swine or Pigs.*)

The most profitable pigs for the farmer are

such as will live and thrive at grass. These possess great energy of stomach, and make excellent pork. Pigs have generally too much food given them at a time, and that too liquid. Potatoes and skimmed milk make an excellent diet for them, if given carefully, that is, a little at a time. I have known a spayed sow that was very poor made fit for exhibition at the Meeting of the Bath Society, in three months, on this food. There is great variety, however, in the digestive power of these animals; some of them fatten quickly on food that would not do so well for others. But whenever the stomach appears weakly, and they do not seem to thrive, the best plan is to turn them to grass for a short time, and feed them afterwards with great care. Pigs have been often *blasted*, as it is termed, and have died in consequence, by giving them too much sweet whey at a time; too much milk or potatoes is liable to produce the same effect. Greedy or voracious pigs are not the most readily fattened, and if not restrained or limited in food, and especially in the articles I have just mentioned, are very liable to indigestion, or flatulent colic, which may produce inflammation of the bowels, or suffocation. When pigs that are put up for fattening do not appear to feed well and thrive, one dram of powdered antimony should be given daily in their food.

BLEEDING.

In all inflammatory disorders bleeding is of the first importance, and cannot be performed too early. A careful observer is able to perceive the approach of inflammatory disorders, and by bleeding, and change of pasture, prevent them. Whenever bleeding is necessary, it should be done freely. One copious bleeding, that is, until the animal becomes faint, or even until he reels, or drops down from faintness, will generally crush the disorder at once; whereas, several lesser bleedings will only keep it in check for a time, till at length it becomes changed into a chronic complaint, or terminates in dropsy. Two gallons of blood may generally be taken from a heifer or steer, or even from a milch cow. The quantity, however, should not be so much regarded, as the effect it produces on the animal. I have seen a heifer reel after bleeding, and fall down from faintness; after lying some time she got up, and appeared panting and trembling, but soon recovered perfectly without taking any medicine, except a little whey. In severe wounds, bruises, or other accidents, the animal should always be bled freely. The only occasion on which local, or topical bleeding, as it is termed, is useful, is in that kind of foul in the foot, or low, which

is attended with painful swelling, and a high degree of inflammation. In this case, the vein, or even the artery that goes to the claw, may be opened; or the animal may be bled in the toe with a drawing knife, as is done in horses.* Sheep are commonly bled by cutting the tail or ears, or by making an incision in the nostril. When the head is affected, they are bled in the eye vein, but from neither of these parts can a sufficient quantity of blood be obtained, or at least very seldom: therefore, it should never be practised. Sir George Mackenzie, in his Treatise on Sheep, advises bleeding in the submaxillary vein, which passes over the angle or edge of the under jaw bone; but, as this vein is closely accompanied with the submaxillary artery, and the excretory duct of the great salivary gland, situated under the ear, the operation is hazardous. Sheep should always be bled in the neck vein, with a small fleam, or lancet. The neck should be corded, and the operator, having placed the animal between his legs, should keep the head on one side, in order to put the vein on the stretch. In this position it is easily opened, either with a fleam, or lancet, after removing the wool, but there is no occasion for cutting away any wool. I have seen a whole flock of sheep bled

* The artery lies in the back part of the leg, and may be opened at the heel. The vein is in front, and may be opened just above the division of the claws.

very quickly in this way, and I have bled them myself both with a fleam and lancet. The quantity of blood taken from this flock of sheep was one pint each. Two or three of them fainted, but recovered in a few minutes. Dogs are bled in the same manner, and may be bled to faintness without danger. Pigs are not so easily bled, and probably do not so often require it, notwithstanding the improper quantity of food that is sometimes given, especially of animal food, such as the bowels of the animals that are slaughtered, also blood and horseflesh. Some pigs having eaten the bowels of a glandered horse that had been taking arsenic, or sublimate, were poisoned by it. When pigs are thus fed, they are generally allowed to run about orchards; but when butchers' pigs are kept on sheeps' bellies, and other refuse parts from the slaughter-house, they never make good pork, though well cleansed, as they call it, afterwards. They are more subject to inflammatory and eruptive disorders than other pigs. Pigs are bled by cutting the ears or tail, or roof of the mouth. And if sufficient blood cannot be thus drawn, they should be turned to grass, and have no other food for a few days.

DRENCHES.

THE drenches commonly given to cattle consist either of pungent acrid drugs, such as grains of paradise, ginger, long pepper, birthwort, &c.; or aromatic seeds, such as carraway, anise, cinnamon, and sweet fennel; or oily and mucilaginous seeds and roots, such as linseed, fenugreek seeds, marsh-mallows root, and elecampane; or lastly bitters, such as gentian, and that ancient composition, name *diapante*. Castile soap is often employed; and electuaries, containing cordials and opium; or astringents, such as Venice treacle, and diascordium. The most common vehicle is a quart of ale. Sometimes gruel is prescribed, or stale urine. And some writers have prescribed a pint of port wine at a dose, which with the drugs to be mixed with it, would cost five or six shillings. Now the only drugs really necessary for the internal diseases of cattle, are the following; and these may be rendered almost or altogether unnecessary, if the advice contained in this little book is carefully attended to.

A List of Drugs used in Cattle Medicine.

Barbadoes aloes, ginger, Epsom salt, common salt, catechu, allspice, caraway seeds, nitre, castor oil, opium, carbonate of soda, carbonate of potash, beer, brandy, or gin.

No other than Barbadoes aloes should be employed. Ginger, allspice, and caraways should be powdered when wanted, or not kept long in powder, unless it be in well corked bottles. When castor oil is not at hand, or cannot be afforded, sweet oil, or new butter, with the whey in it, may be substituted. The best method of giving opium is in the form of the anodyne carminative tincture, and if this is not at hand, tincture of opium or laudanum may be employed. The latter contains twice as much opium as the former. When beer is employed as a vehicle, it should be of the best kind, and not stale or harsh. It is an excellent cordial by itself, but is improved by a little allspice and caraway seeds, and sometimes by a little ginger and carbonate of potash.

It is much better to give a moderate dose of cordial medicine, and repeat it every morning and evening, for a few days, than the large doses usually prescribed by writers on cattle medicine. The latter are apt to injure the stomach, though they may afford temporary relief. The effect of the former is often permanent, for, by keeping up the tone of the stomach for a few days, a more perfect digestion takes place, better chyle is formed, and consequently a more pure or richer blood. By such blood the stomach, as well as all other parts of the body, becomes strengthened, and the brain, the

source of nervous energy, participates in this general improvement. The dose of beer I usually give is half a pint, with a dram of ginger, 2 drams of allspice, and 3 or 4 drams of caraways. These ingredients should be first steeped, or gently simmered, for a few minutes, in half a pint of water or table beer. When a cordial astringent is wanted, 2 drams of catechu are added. Aloes and common salt are the best purgative for milch cows, especially when the stomachs have been weakened, as they often are, by feeding on bad hay. It is necessary on such occasions, to add some cordial medicine, such as ginger, and a little of the anodyne carminative tincture, or, when that is not at hand, a glass of gin; 4 ounces of salt require to be diluted with a quart of water.

I would advise every proprietor of cattle to keep the anodyne carminative tincture, and a compound powder of aloes, made of 4 parts Barbadoes aloes, and 1 part ginger; 2 or 3 drams of carbonate of soda is an useful addition to opening drenches. Some cordial powder may also be kept in a well corked bottle, composed of 1 part ginger, 2 parts allspice, and 3 or 4 of caraways; 2 drams of catechu, added to a dose of this cordial powder (6 or 7 drams), form the cordial astringent powder. Two drenching horns should be kept, one of a large ize for cattle, and a small one for sheep and

calves. In the list of medicines should be included the solution of potash, which I have prescribed for indigestion, or cords in calves. This is easily made, and should always be kept.

CLYSTERS.

THESE are too much neglected in the diseases of horses, and still more in the complaints of cattle, though they are of great use in both, and even if employed unnecessarily, cannot do any harm. When an animal is *blasted*, as it is termed, (See *Blasting*,) the stimulus of the salt water which forms the clyster is propagated upwards, even to the stomachs, and greatly assists in the discharge of the confined air, as well as of any indurated excrement there may be in the bowels.

The only clyster necessary for this purpose is a solution of common salt in water; half a pound of salt to 4 or 5 quarts of water. The clyster pipe may be had of Mr. Long, Veterinary Surgeon's Instrument-Maker, Holborn, London. And I would advise every proprietor of cattle to be provided with this instrument, with a large bullock's bladder firmly tied to it. Before the bladder is tied on, it should be soaked a few minutes in warm salt water; it should then be rubbed dry with a cloth, and when tied on to the pipe, it should be blown, and the air confined by corking the mouth of the pipe. In this way the same bladder will last a considerable time.

PROBANG.

THIS is an instrument for letting out confined air from the stomach, when cows or sheep are blasted, or blown, and may be purchased at the sadlers'. In order to pass it down the throat, an assistant must lay hold of the nostrils, and keep out the head as nearly as possible in a line with the throat. The distance between the mouth and the stomach is about six feet. The probang, therefore, must be more than six feet. In sheep, one half of that length would be sufficient. A piece of small cane, about two thirds of an inch in diameter, with a smooth wooden knob at the end of it, would answer the purpose for sheep. Three smaller pieces (of sufficient length) bound together with waxed pack-thread, and a smooth knob at the end, would answer the purpose for cattle. All proprietors of cattle and sheep should be provided with these instruments.

FOMENTATIONS.

Hot water, with a little oil or grease in, is as good a fomentation as any.

ESSAYS

ON

THE STRUCTURE, ECONOMY,

AND

DISEASES,

OF

HORNED CATTLE, AND SHEEP;

BEING

A SERIES OF COMMUNICATIONS,

SENT TO THE

BATH AND WEST OF ENGLAND SOCIETY,

FOR THE

Encouragement of Agriculture, Arts, Manufactures, and Commerce.

PREFACE

TO

THE ESSAYS.

IN the year 1817, I attended the annual meeting of the Bath Agricultural Society, and was introduced by my friend, Mr. Jillard, to many gentlemen, eminent for their knowledge of agricultural subjects. I then promised to devote such a portion of my time to an investigation of the diseases of cattle, as would enable me to do something towards the improvement of that hitherto neglected branch of the veterinary art. The following Essays, and the preceding Compendium, are the result of that investigation. The Essays may be thought somewhat irregular, and to contain some repetition, yet they will form but a small addition to the Compendium; and will be found useful, not only by the practical observations they contain, but by the new and diversified manner in which the subject is arranged. Some parts of the present Essays are designed for professional readers, for it is from such that further improvement is to be expected, and I hope that the view I have given

of the structure and economy of the digestive organs of the cow, will induce such readers to reflect on the subject, and see in it the basis of all useful knowledge of the subject. If they proceed from this to a consideration of the blood, and the importance of its purity to the health of the body; if they view it still more profoundly as the source of vitality, and as affording to the brain and nervous system that support on which their power depends; they will be led to a conviction, that by good management, with respect to *food*, *water*, *air*, and *exercise*, almost all the internal diseases of cattle may be prevented.* From this they will be led to reflect on the mischief that results

* I had once the honour of spending a day with the late Dr. Jenner, that amiable and illustrious physician, whose invaluable discovery has proved such a blessing to the world. The Doctor condescended to converse with me on the diseases of cows; and informed me, that giving wholesome water to those animals was of more importance than the public is aware of. He told me there was a farm in the neighbourhood, where three or four farmers had sustained so much loss from abortions in their cows, from red water, and other diseases, that they were either ruined or obliged to give it up. The present occupier, after he had held the farm five years, and sustained great loss, suspected that the water they drank was the cause of the mischief, and therefore sunk three wells on different parts of the farm, and pumped the water into troughs for the cattle. The ponds were fenced round to prevent them from getting at the water, so that they drank only from the troughs. Since that time the farmer has not

from the too general practice of feeding them on bad hay during the winter, and of tying them up during several months of the year. The first of the farmers mentioned in the foregoing note assured me, that he had found great advantage in letting his cows exercise themselves in a large wholesome farm yard, instead of tying them up in winter. They gave more and better milk. The hay given to milch cows in Glocestershire is better than it is about Mendip, where they cut often after the seed is formed, and sometimes after it has become ripe. This is the source of much mischief. There is scarcely a farmer that will not admit that good hay can be obtained only by mowing early; yet

had a single abortion (termed warping in Gloucestershire), or one case of red water. His cattle have been free also from swelled udders; and, what is of great importance to a Gloucestershire farmer, he makes more cheese, and it is greatly improved in quality. The Doctor wished me to visit this farm, which I did, and another at a short distance. I found that the usual mode of watering cattle where there was no brook, or running water, was from a pit of stagnant rain, or spring water, to which the cattle had access by means of a sloping path on one side only. It has been observed that cattle, immediately after drinking, dung and make water; sometimes in the water, or close to it; and almost always before they leave the sloping path. The dung and urine therefore flow into the pond, or are washed into it by the rain, and make the water so impure, that it has been found to kill eels, and nothing but noxious insects can live in it. The disgust which such water must excite in animals accustomed

scarcely one who will mow until he can obtain the largest quantity, without any regard to quality. The great object of his attention is to dry it at as little expense as possible, considering good weather as the only object worth attention. This, however, is a subject for agricultural writers, and well worth their most serious atttention. Another useful object I trust will be accomplished by the view I have given of the subject; it will lead the reader to see the absurdity of the expensive recipes contained in books on cattle medicine, and employed by cattle-doctors. Notwithstanding what has been said on the importance of the purity of the blood, I have endeavoured to impress on the reader's mind the necessity of early and copious bleeding in all inflammatory disorders; for it

to drink from brooks, is gradually overcome in a great measure, and they sometimes drink it without appearing to suffer; but the influence it has upon the animals' health is strikingly shown on this farm. On visiting the other farm, where the cows had been prevented from drinking this pond water only six months, the beneficial effect of drinking wholesome water was sufficiently obvious to demonstrate its utility. Before that time, they were frequently meeting with red water and swollen quarters, i. e. a swelling of a part of the udder: but since the cows had drank pure water, not one case of either had occurred. Since my return to Oak-hill, which was only yesterday, I have heard of a farmer at Whitchurch, who has discovered that giving his cows wholesome water is essential to their health, and to the goodness of their milk, butter, and cheese.

is in such diseases that the common practice almost always fails. I have taken two gallons from a heifer, and thereby saved her life. Cow-doctors rarely take more than two quarts. The prevention of the disease is, however, by far the most important object, and consists in giving the animal wholesome food, proper shelter and exercise during winter, and wholesome water at all times.

JAMES WHITE.

Oak-hill, near Bath,
Sept. 1821.

ESSAY I.

INFLAMMATION OF THE LUNGS IN SHEEP.

The most frequent and the most fatal disorder of sheep, next to the rot, is inflammation of the lungs, which occurs very commonly in the month of April, when the sun during the day is at times very powerful, and the nights and mornings are extremely cold. Lambs often die of this disorder, which they get by frisking about and overheating themselves in the hot sunshine. I was requested last spring to attend some sheep, belonging to Mr. Baker, a respectable farmer of Wookey, who, out of a flock of three hundred sheep had lost between fifty and sixty. On opening some of those that died, I found that the disorder which had occasioned their death was inflammation of the lungs and heart; and upon enquiry I discovered that the treatment employed had been bleeding, and leaving them then wholly to nature. Their bleeding, however, consisted in cutting the ears, the nostril, or the lip; in which manner only a small quantity of blood could be obtained. I directed, or rather advised, that a pint of blood should be taken from the neck vein, in the

same manner that it is from horses and bullocks. This was performed without difficulty, and without cutting off any of the wool from the neck; and then I desired that a dose of Epsom salts, dissolved in gruel, might be given; this also was done, and these were the only remedies employed. Three of the sheep that were extremely ill at the time, died, and those, I believe, were all that were lost after this treatment was adopted; all the rest recovered and became perfectly healthy. It is to be regretted, that in this, as in most other disorders of cattle, curative means, and especially bleeding, are resorted to so late. In this case, had not bleeding been employed when it was, I have no doubt that the whole flock would have been lost; for inflammation of the lungs is sometimes of the catarrhal kind, and often infectious; which was the case in this instance. It is of importance in this, as in all other inflammatory disorders, that bleeding be employed as early as possible, and freely; that is, even to faintness. It is also essential that the animal be kept in the open air, and not put into a house, as is too often the case; for there is nothing that tends more to encourage inflammatory action in the system than a warm confined air. This practice is often repugnant to the feelings of the proprietor in the treatment of catarrhal affections, or severe colds, both in cattle and horses, for he gene-

rally imagines that warm air and warm clothing are essentially useful in those complaints; but this is a very pernicious error, as in all those complaints, whether it be a slight or a severe cold or catarrh, or even that epidemic form of catarrh named distemper, cool air, and in summer the coldest air is of the most important use; and with the assistance of bleeding, and keeping the animal where there is but little grass, renders medicine unnecessary.

Wells, May 20, 1820.

P. S. Every sheep in the flock was bled in the above case, whether affected with the disorder or not. There were but few, however, that were not affected in some degree, and they were dying very fast. It was adopted, therefore, as an useful precaution, and so it proved; for every sheep, except the three which were before in a dying state, perfectly recovered. Bleeding, therefore, was in this instance a preventative, as well as a remedy. Other flocks in the neighbourhood were affected, and successfully treated in the same manner. The Epsom salt was given imperfectly, and not to the whole; and I am inclined to attribute our success, principally, if not wholly, to the bleeding. Some of the sheep fainted from the loss of blood, but soon

recovered, and did very well. The quantity of blood taken off was a pint-cupful, which weighed exactly a pound: the symptoms were hanging of the ears, dulness of the eyes, running at the nose, cough, and quick breathing.

ESSAY II.

ON RED WATER.

THIS disorder most commonly happens in the month of May or June, and though often of an inflammatory nature, is connected with, or dependant on a weakened or disordered state of the organs subservient to digestion, that is, the stomachs, and probably the liver also. Doctor Jenner has examined several cows that died of red water, and in all of them found the heart highly inflamed; whence he concludes that the discharge of blood with the urine is an effort of nature to cure the inflammation of the heart. I have just received a letter from an experienced farrier in Yorkshire, in which he states, that in cows which have died of red water, he has always found the kidneys in a very tender state, and sometimes enlarged, and that the contents of the third stomach are generally very dry. He states, also, that it is more severe in cows that have lately calved, in good milkers, and in old cows that have been good milkers, than in heifers, or young cows; and that he never found any difficulty in curing it in young steers, or oxen. In the beginning of

May, he says, or soon after lying out, it is often very severe for a month or six weeks, especially when the weather is changeable, or when it is very hot. Cows that have been tied up during winter, he observes, are most liable to it. In the country about Proud Preston, in Lancashire, especially in low damp situations, it is very prevalent, and often fatal. The red water is there named murrain, probably from so many cows dying of it. In sheltered and elevated situations it does not happen so often. In this country (near Leeds), it occurs in June, as well as in May. Cows that are brought from Yorkshire into Lancashire are "almost sure" to have the red water, or murrain, as it is there termed. The medicine employed by this farrier (Mr. Sumner, of Bristal, near Leeds) is a saline laxative, with aloes and caraway seeds; and this he gives whether the animal is costive or not. The following is his recipe.

Barbadoes aloes	6 drams
Glauber's salt	6 ounces
Calomel	1 or 2 drams
Powdered caraways	1 ounce

If the water is not better in twenty-four hours, he gives an astringent drench, composed of alum, acetate of lead, sulphate of iron, and caraway seeds; or starch and old milk boiled together, to which is added afterwards, 1 ounce

of oil of turpentine, and 1 ounce of powdered caraways. The bowels, he observes, should always be kept open. The same observation is made by the farriers and dairy-men in Somersetshire, who generally give whey for the purpose in considerable quantity. Bleeding is not often employed in red water, yet there are cases in which I believe bleeding is necessary, and I think it probable that many of those cows that die of red water die from want of early bleeding. I have known it successful, when a cow on the same farm died under different treatment. A saline laxative, however, was given immediately after the bleeding. If many cows that have died of red water, have been found, on examination, with the heart much inflamed, as stated by Doctor Jenner, and Mr. Tanner, is it not a reasonable inference that they died from a want of early bleeding?

I am of opinion, that the common method of keeping and feeding cows during winter, that is, tying them up, and giving them bad hay, is the source of this and other disorders. By this treatment, not only the digestive organs, but the constitution generally is deranged or weakened; the vital power is more or less diminished; and the kidneys are relaxed, or their secretory vessels enlarged, by carrying off from the blood the excrementitious matter engendered by unwholesome feeding. This state of the body constitutes the predisposition to red water, and when the animal is turned to grass

in May, the change of food excites a powerful appetite, and quickens digestion. It gives temporary energy to the system: but this is not of long continuance, especially if the digestive organs have suffered much, which is generally the case after three or four winters' bad feeding, or after a cow has had several calves, or has been a remarkably good milker, or if she has been kept much in a cold exposed situation, or is naturally of a weak constitution. Bad water is very injurious to animals, especially to the milch cow; and is a fruitful source of disorder, as has been observed in the Preface to the Essays. (See *Preface.*) In the neighbourhood of Shepton Mallet a great number of cows have been cured of red water, by a drench composed of 2 ounces of tincture of cantharides and 2 ounces of alum. In the neighbourhood of Wells they generally give 1 ounce of Friar's balsam, and 1 ounce of oil of turpentine. After this drench the animal has whey given her several times a day. Urine has been given with good effect, but I believe the drench I have prescribed in the Compendium, is by far the best remedy, except when the disease is clearly inflammatory, and then I prefer the following drench:

Epsom, or Glauber's salt.... 8 ounces
Castor oil, or sweet oil...... 4 to 6 ounces
Water, or whey............ 1 quart.

A change of pasture is always adviseable.

If red water depended on inflammation of the

heart, tincture of cantharides and oil of turpentine, one would suppose, would be highly injurious; yet it certainly cures the disorder in the neighbourhood of Shepton Mallet, as I am informed by Mr. Bartlet, a respectable druggist of that place, who sells many drenches composed of this tincture and alum, and, on enquiry, he generally finds that they have effected a cure: but I have seen the disease go off spontaneously, and am inclined to believe that it would often do so, if the animal were turned into bare pasture. In what other manner can we account for such different, and even opposite modes of treatment in curing red water? My enquiry, on this subject has been extensive, and carefully conducted, and though in every place I hear of an infallible recipe for the disorder,—for almost every druggist, as well as every cow-doctor, professes to have a never-failing remedy,—notwithstanding all this, I find, that in every country where red water prevails, a considerable number of animals die of the disease, which is well known to those employed in kennels. Now, as Dr. Jenner has examined many of these animals at the kennel, and always found the heart inflamed, I cannot help concluding, that the death of such animals was either accelerated, or caused by the stimulating drenches employed, or by want of timely bleeding, and a saline laxative. All cow-doctors, as well as writers on cattle me-

dicine, appear to agree in one thing, and that is, the propriety of keeping the bowels open, and in admitting that unless this is done the animal will certainly die. This is often done by giving whey, or whey that has had tallow or candles boiled in it, and by opening the fundament, by introducing two fingers, and then separating them a little, so as to keep the sphincter open a short time. This affords relief, by allowing the hard excrement that obstructs the contracted gut to pass off. A clyster of warm water, with a little salt and oil, or salt water only, would be found, I think, more effectual. There is generally a purging in red water, that is, the dung is very thin, and almost fluid, and discharged with considerable force, in a stream scarcely larger than a tobacco pipe. This discharge is often interupted by hard excrement, which appears to come from between the leaves of the third stomach. Giving the animal whey every three hours during the night as well as the day, is therefore of great use. And it is no less so to introduce the fingers into the fundament now and then, lest the gut become obstructed by hard clots of excrement. I have been informed that blistering the sides in red water has been very useful, in addition to the drench that may appear suited to the case.

ESSAY III.

ON THE QUARTER ILL, OR QUARTER EVIL.

THIS disorder attacks cattle when they are about one year old, but sometimes rather later. It is a dangerous and destructive disorder, and known in some parts of England by other names besides the above; such as black leg, black quarter, shoot of blood, &c. It depends upon repletion of the blood vessels, and is brought on by putting the young animal, when in low condition, too suddenly into good pasture, or even into such as is moderately good. The same cause, in three or four years old stock, or in working oxen, will produce the inflammatory red water, or that which depends upon the repletion of the blood vessels; because, in such stock, the kidneys have been previously brought into a relaxed and morbid state, by the habitual use of unwholesome food, or, rather, by feeding for several winters on such food. In younger stock, as yearlings, the kidneys are more healthy, and capable of resisting morbid impressions, or, rather, the too sudden influx of blood. In them the kidneys resist, equally with the other vital organs, until the heart and lungs are suf-

focated with blood. The approach of the disease is observed by the animal separating himself from his companions, appearing listless, heavy, and refusing his food ; but it often comes on so suddenly, that the owner has scarcely an opportunity of observing what are the first symptoms, sometimes finding him dead before he has an opportunity of doing any thing for his relief. The immediate symptoms of the disorder are lameness, and swelling of the hind quarters, and, sometimes, of the shoulders and fore parts. These swellings, when pressed, make a crackling noise, from an effusion of air into the cellular membrane, occasioned by a putrid state of the blood. Like other putrid disorders, it is, at its commencement, of the most highly inflammatory kind, and can be cured only by immediate and copious bleeding ; that is, until the animal faints. Nothing short of this can do any good. When the swellings have taken place to any extent, it is generally too late to do any good ; bleeding is the only remedy that stands any chance of affording relief, and should, therefore, always be tried, at whatever time the disorder is first perceived. The quantity of blood drawn should never be attended to, but the effect it produces, and that is faintness. It is almost needless to add, that this is an important disorder, and carries off a great number of young cattle ; as is a fact well-known from having been so often painfully ex-

perienced. But that it is contagious is a circumstance, I believe, that few farmers, or practitioners, are aware of. I am of opinion, that murrain, pestilence, or pest, is, in its origin, precisely of the same nature as Quarter Evil; and were the latter disease to occur during a hot summer of long continuance, and were the animal suffered to die, (for he may be cured by early and sufficient bleeding,) and the precaution of burying the carcase immediately, unskinned, neglected, we might once more be visited by those dreadful epizootics, which formerly committed such ravages among cattle in this country, but more especially in the south of Europe. It is stated by Lancisi, that in the year 1813-14, about thirty thousand head of cattle died in the course of nine months, in the Ecclesiastical States of an epizootic, or contagious disorder, which then prevailed. There may be difficulty in persuading farmers to bleed to the extent I have recommended, but moderate bleeding will do nothing; and I can venture to affirm that there is no danger whatever, in bleeding to faintness, and I am inclined to believe that in the Quarter Evil it will always be found effectual, if seasonably employed. Local applications are unnecessary, and the only medicine required, is from four to six ounces of Epsom salt or common salt in a quart of cold water. This should not be given until the animal has been bled.

It has been the fashion, of late years, to make light of contagion, and the consequence has been the prevalence of fever, to an alarming extent. A similar opinion has prevailed with regard to cattle, and I have known very serious losses result from it. Such losses, I hope, will not in future occur. The remedy I have recommended, if employed in season, will, I believe, generally be found effectual. But should those, for whose use it is intended, be deterred from employing it, on account of its formidable appearance, I trust they will not neglect the precaution I have suggested, in burying the dead animal, unskinned, as quickly as possible.

ESSAY IV.

ON FEEDING WITH OATS.

I HAD occasion to visit, a short time since, a very fine dairy; the best I think I ever saw. On examining the cows that were tied up to be milked; I found that each cow had a considerable quantity of oats before her, in a manger made for the purpose, without chaff, or any mixture whatever. On inquiry, I found that each cow was allowed half a peck twice a day, and that they gave but little milk. The business which brought me there was to prescribe for one of the cows, which I found labouring under what the cow-keeper called a *sort of a chill*, or a touch of the yellows. It was a well marked case of indigestion, attended with symptoms of flatulent colic, or gripes. The cow refused her food, and had lost her quid, as they term it, that is, was incapable of ruminating. She appeared to be in considerable pain, her back was drawn up, she was costive, and did not appear to have voided urine. She was very restless, and soon laid down again, threw her head round towards her belly, and attempted to strike it with one of her hind feet.

The ears and horns cold. The pulse was between seventy and eighty, which is ten above the natural beat of the cow's pulse. I threw up a clyster, of above five or six quarts of warm water, with one pound of salt dissolved in it, and gave the drench I always employ on such occasions, that is, 4 drams of Barbadoes aloes, 1 dram of powdered ginger, 4 ounces of table salt, and 1 quart of water. Into the first hornful of this mixture, I put half an ounce of tincture of opium, (I now substitute for tincture of opium, 2 ounces of the anodyne carminate tincture). This was all the medicine I administered. I ordered the cow to be turned out immediately. About three or four hours afterwards she was drenched twice with whey. This made her rather sick, therefore she was turned out again, and I directed nothing more to be given. I should have observed, that the drench soon put a stop to the symptoms of gripes, but there was still great uneasiness, and evidently an obstruction in the third stomach. Soon after taking the whey, she dunged, and with her dung there was a considerable number of unchanged oats, not soft and swollen like those voided by the horse in his dung, when he masticates imperfectly, for they appeared to have undergone no change whatever. I saw her again at night. She appeared still in pain, and shivering in her hind parts; her back was drawn up, and the cow keeper considered her worse. She was not

griped, however, and I was satisfied, from her appearance, that the aloes and salt where then doing their work in the third stomach, and that that was the cause of her not seeming so well. I directed, therefore, that she should still be kept out and have nothing more given her. During the night she was completely relieved, and in the morning was found grazing. I have described this one case, not only to show the method of treating it, which I think will always be found effectual, but to prove likewise the impropriety of feeding cows in this manner. In the first place, it appears to me, that oats eaten alone cannot be ruminated without great difficulty; and even supposing that they could, I have made it appear sufficiently clear, I trust, in a former paper, that grain does not promote the formation of milk, but of fat; and that, in so doing, the disposition of the animal becomes changed, from that of providing for her young, to that of propagating her species. The balance then between the lactiferous and the chyliferous systems undergoes a change; the chyliferous system predominates, and the food that is taken in goes principally, and perhaps in a short time wholly, to the production of fat. The purpose, therefore, for which the oats are given must be entirely defeated, for these cows are kept solely for the dairy.

I could not but consider the feeding of cows with oats as a very extravagant and useless

practice; if not absolutely injurious, as likely to couse indigestion; and I have since learned, in corroboration of my opinion, that the practice has been abandoned.

ESSAY V.

ON THE DISEASES OF CALVES.

I BELIEVE almost all the diseases of calves originate in the digestive system, or rather in the fourth stomach, which is the only one required when the young animal feeds on milk, provided he is fed with moderation. When a calf is intended for the butcher, making him fat expeditiously is the object sought after, but this cannot be accomplished without due attention to the *state* of the stomach. Many farmers seem to think that fattening depends merely on giving plenty of milk; but if more than a sufficient quantity is given, instead of doing good, it oppresses the stomach, and lessens the digestive power. In consequence of this, an acid is formed sometimes in such quantity, and of such strength, as to derange the bowels, and cause scouring, and not unfrequently colic, convulsions, or cramps: it is better to give too little milk at a time than too much. It is difficult, perhaps impossible, to ascertain precisely the quantity that the stomach can take with advantage, for the appetite of young animals is sometimes a fallacious guide; but if a smaller

quantity is given than the stomach is capable of digesting, it is sure of being perfectly digested. If the calf is to be reared, there is great advantage in keeping him rather lean than otherwise, for he will be less liable to disease, and, when weaned, will be found to thrive much better and be hardier. Calves that are brought up by the hand, or *at the pail*, as it is termed, should have the milk given them as fresh as possible, as it is then most easily digested: when it cannot be obtained in this state, and appears to disagree with the animal, a little powdered chalk may be added. Whenever a calf becomes costive, a laxative should be immediately given, and when he scours, the following cordial will be found effectual.

Laxative for Calves.

Epsom salt	2 or 3 ounces
Carbonate of soda	2 drams
Water	6 or 8 ounces
Ginger	1 dram

Mix.

Cordial for Calves.

Caraway seeds recently powdered	½ ounce
Ginger	½ dram
Carbonate of Soda	1 dram
Water	8 ounces
Brandy or gin	1 ounce

Mix.

Arrow-root, wheat, or barley flour gruel, is a good drink for Calves that appear weakly, and liable to scour. I know a dairy-man, and one of some experience, who gives a table spoonful or two of brandy in a small quantity of urine, to a scouring calf, and this generally proves effectual. He gives half a pint or more of urine alone to a calf while rearing, that happens to be rather costive and unthrifty, and always finds great advantage from it. Calves are said to be subject to dysentery, but this is nothing more, I believe, than a disordered state of the bowels, arising from inattention to those symptoms I have before noticed; that is, scouring, imperfect digestion, and costiveness. This chronic affection of the bowels is sometimes difficult of cure, and not unfrequently ends in atrophy or consumption; the only chance of cure, is in giving food in small quantity at a time, such as fine wheat flour gruel, with a little fresh milk, and sweetened with treacle or sugar. A sheltered field is the best situation for the calf in good weather, and when the weather is unfavourable he should be put into the cow barton. Lime water is a good corrector of accidity in the stomach, but the most powerful is the solution of potash, the prescription for which will be found in the chapter on the disorders of calves.

ESSAY VI.

ON HYDROCEPHALUS, OR GIDDINESS IN SHEEP.

I SEND the following observations on the *hydrocephalus* in sheep, under a conviction that they are sufficiently useful to be made public. This disorder is very common in sheep, and so well known, that a description of the symtoms would be unnecessary, were it not for one circumstance connected with them, that has never been noticed, though absolutely essential to the cure. The principal symptom is that of the animal turning round, generally many times, in endeavouring to move forward; especially when hurried, and in the more advanced stages of the disorder. From this, the disease has been named giddiness, gid, turnsick, &c. Sometimes the cerebellum is affected, and then the animal, instead of turning round when hurried, or in endeavouring to move forward, appears lame in the hind quarters, generally on one side only, and most commonly the *Left.* In moving forward quickly, he goes nearly straight, but the left hind quarter is so inclined as to make him appear somewhat crooked. It must now be remarked, that in turning round, the sheep gene-

rally moves on the same side, *and that the hydatid, or bladder, as it is termed, is generally on the opposite side*. The cause of his turning round is supposed to be giddiness, but it may depend also on his being blind in that eye. In the early stages of the disorder, the turning round is not so remarkable, unless the animal is hurried, but at a later period, he constantly does it in attempting to move forward, and at length becomes so completely palsied, that he falls down, and is unable to get up again, and in that situation generally dies. It has been thought that the hydatid sometimes is found on the surface of the brain; this I think is a mistake, and may have arisen from the hydatid having so far destroyed the sides of the cavity, named the ventricle of the brain, that the roof, or upper part, becomes scarcely more than the twelfth of an inch in thickness. I have never seen it completely worn through, except once, and then the hydatid burst, and the water was discharged through the opening in the skull. The whole of the skull covering that lobe of the brain becomes extremely thin, and sometimes small holes are found in it, especially immediately behind the part where the horns are situated. There is no difficulty in accounting for the pressure of the hydatid being principally directed against the skull, or rather operating on that part. The resistance of the tentorium posteriorly, and of the falciform process of the dura mater laterally,

is not greater than that of the dura mater covering the superior part of the brain; but the bones underneath, where the pressure must ultimately be received, are considerably stronger. But the principal cause is, that the part which appears to be the mouth of the hydatid, is drawn in like the neck of a common bladder, and is situated in the fossa, between the corpus striatum and corpus pyramidale. From this part it enlarges upward, and its growth or distension is directed against the roof of the ventricle. I have observed that the hydatid is found also in the cerebellum, or small brain; this, I believe, is not a frequent occurrence; but when it does happen, it will produce the symptoms I have described. I have stated that in general one side or lobe of the brain only is affected, except in the last stage of the disorder, as will soon be explained; and I am also of opinion, that that side is generally the right. The same observation applies to the cerebellum, which is never affected, I believe, at the same time with the brain. Sir George Mackenzie and others who have written on this disorder, have described operations as cures for it, without informing their readers by what appearance they are to distinguish the affected side. Now, if the sound lobe of the brain is punctured, the animal would drop down and soon die, so that, admitting the operation to be effectual, it must be an equal chance whether it kills or cures. There is no difficulty

whatever in puncturing the hydatid through the upper part of the skull, or parietal bone; and the part before-mentioned, that is, behind the part where the horn grows, and where a small opening in the bone is often found, is the best part for introducing the instrument. A shoemaker's awl will answer the purpose, but a common brad-awl, made sharp at the point, and square, and not more than one inch in length or rather less, or triangular above, would do better. One puncture is sufficient to kill the hydatid. The fluid will not escape readily or quickly, nor will the good effect be immediately observed: only a very small quantity of fluid will be seen upon the wool after the instrument is withdrawn, so inconsiderable, indeed, that the operator might be induced to make a larger opening, but the small puncture I have described is sufficient to cure the disorder. Nothing more is to be done. The hydatid of the cerebellum is incurable. It must appear wonderful that the right side, or lobe of the brain, as well as of the cerebellum, should most commonly be the side affected. It is well known, that when the brain is oppressed on one side, the organs of sense, or motion, on the opposite one, are always affected; and from this cause it is that the giddy sheep is almost always blind in the left eye, and turns round on the left side. It appears to be a general law in the animal economy, that where there are duplicates of parts, the left side shall be

affected in preference to the right; and it is a curious circumstance that the right lobe of the brain is generally affected in hydrocephalus, but still in conformity with this law of nature. Thus it is that the left eye is always affected, and when the disorder has proceeded so far as to disturb the functions of the brain generally, the animal becomes paralytic, first on the left side, and if it live long enough, at length it becomes entirely so. On examining the brain of a giddy sheep, nearly the whole lobe will be found destroyed: after drawing out the hydatid, a cavity is left capable of containing from two to three ounces of water. But notwithstanding this extensive injury, for all the surface of this cavity appears diseased and ulcerated, the sheep feeds well, and acquires fat, until the disorder is very far advanced, and then probably his leanness may depend as much, or more, on want of food, as on derangement of the digestive organs. It is a wonderful circumstance, however, and may well excite our admiration and gratitude, that the disorder is not permitted to destroy the animal until the flesh and the fleece have arrived at that perfection which is necessary for the use of man. The alarming prevalence of this disorder, as well as of diseases of the liver and lungs, appears to be in conformity to the general laws of nature. The soil and situation in which animals are originally placed is that which is most fit for them, and if they are removed, or if

an attempt is made by crossing the breed, as it is termed, to improve the works of the Creator of the universe, it will, sooner or later, be found injurious, or even destructive. If a person of thirty-five or forty years' experience in sheep-husbandry will compare the prevalence of diseases at the present period, among these animals, to what it was thirty years ago, I am much mistaken if he does not find that they have been gradually and progressively increasing since that period. What other inference can be drawn from this circumstance, than that by endeavouring to improve the breed, an increase of constitutional debility and hereditary diseases has been produced?

Since writing this essay, I have found, from dissection, that common hydrocephalus is very frequent in sheep, and produces symptoms which are commonly named *goggles*, and are different from those produced by an hydatid in the lateral ventricle. In goggles, or common hydrocephalus, the water, as it accumulates, descends through the iter ad quintum ventriculum (for in quadrupeds the olfactory nerves are cavities, or ventricles), into the fifth ventricle, and from thence into the sheath of the medulla oblongata, and even to that of the spinal cord, in which case it often escapes upon cutting off the animal's head. In goggles, the symtoms are more serious than in giddiness, and more speedily destroy the animal. It is always, or most commonly, attended by some degree of paralysis and lameness in the fore or hind parts, generally of the left side, and an inclination of the head to one side. Like the gid, or hydrocephalus from hydatids, it is hereditary, and affords

a striking proof of the degeneracy of the race, in consequence, I believe, of the attempts that are made to improve the breed, by crossing and removing them from their native situation.

In hydrocephalus from giddiness a sheep may live a considerable time, and so he may in common hydrocephalus, but this last is seldom discovered until the disorder has arrived at some height. I lately opened the head of an ewe belonging to General Bathurst, affected with common hydrocephalus, in which nearly all the water had descended into the sheath of the spinal cord, and escaped upon cutting off the head. The mischief done here was principally in the fifth ventricle, where a considerable depression was observable. The Schneiderian membrane was highly inflamed. A large hydatid, containing about four or five ounces of fluid, was attached exteriorly to the colon.

It is probable, I think, that the water found in the ventricles of the brain in common hydrocephalus, or goggles, was originally contained in an hydatid, or bladder; and I have seen a case where the hydatid appeared to have forced its way through the septum lucidum into the opposite ventricle; in this way, perhaps the bladder is sometimes burst, and common hydrocephalus produced. I have been informed that there are shepherds in Dorsetshire who cure giddy sheep without difficulty, merely by puncturing the hydatid, and applying afterwards a pitch plaister. I have several times taken out the hydatid, but always, I believe, at too late a period to do good. The sheep have lived after the operation, but did not appear to be relieved by it; they were therefore killed, and given to the poor. On examining the head of a giddy sheep, a soft part or spot will be found on the skull, just behind the part where the horn grows; and if the sheep is blind in one eye, which is always the case in the early stage of hydrocephalus, the hydatid will be found on the opposite side.

When the soft spot I have described is felt, it may be carefully opened with the point of a pen-knife; part of the hydatid will then force its way up, and appear as a small bladder protruded through the opening that has been made. This bladder may then be opened, and the water will gradually flow off. If the bladder is then carefully laid hold of with a pair of forceps, it may gradually be drawn out, but this has never answered, and I think it a better plan merely to open it. The shepherd's plan is probably still better, which, I believe, is merely to puncture the skull, at the soft part, with a straight awl, not longer than half an inch.

I have lately attended some lambs that were attacked with palsy of the hind parts, either partial, or total. I examined one of them, and found the internal parts tolerably healthy, and the brain free from hydatids; but the spinal marrow and nerves going from it, had a weakly appearance, especially at the loins. There appeared, also, a tendency to form hydatids within the spinal canal, or the cellular texture appeared inflated and watery. This, upon inquiry, appeared to have been occasioned by the weakly state of the ewes in consequence of hard keep, and eating very bad hay.

ESSAY VII.

A GENERAL DESCRIPTION OF THE DISEASES OF CATTLE.

It may be observed, that in the various papers I have had the honour to communicate to the Bath and West of England Agricultural Society, the medicines I have prescribed are few and simple; but I will venture to assert, that upon a fair trial, they will be found sufficient to cure all the internal disorders of cattle that are curable. This may be thought a very bold assertion, especially by those who are acquainted with the strange heterogeneous mixtures employed by cattle doctors, and the absurd and expensive recipes contained in books on cattle medicine. It is, nevertheless, true, and easily demonstrated, by giving the medicines I have recommended a trial. The internal disorders of cattle may, with propriety, be divided into two classes. First, those of the organs subservient to digestion and chylification; secondly, those of the sanguiferous system, or blood vessels. The former may be cured by means of the three simple prescriptions I have alluded to; the latter by the fleam. In both, however, the animal's diet is an object of

the greatest importance: for to what purpose would it be to remove the accumulated matter which occasions the disordered state of the digestive organs, were the animal still kept on the same diet which produced it; or what benefit could be expected from relieving the vital organs when oppressed by a redundancy of blood, if the animal were afterwards allowed to feed at pleasure, and form as much blood again, in a short time, as that which had been drawn off?

In the treatment of the disorders of cattle, attention to feeding is an essential object, and is equally, or more important, as a means of prevention; for it is not too much to assert, that nearly all their disorders originate in improper management as to feeding. A morbid susceptibility, or a pre-disposition to disease, may be propagated by negligence in breeding, and may be produced by taking animals from their native soil and climate, and placing them in colder situations; for cold and moisture are often powerful agents in lessening the vital power, and especially that of the digestive organs. Still the principal, and often the immediate cause of their disorders is improper feeding. The most fruitful source of disease in cattle, and especially milch cows, is bad hay,* and even such as

* Unwholesome water is often a cause of disease in cattle, especially milch cows. See Preface.

is, by many, considered tolerably good. The fibrous parts of such hay gradually accumulate between the leaves of the third, or foliated stomach; here they are compressed from time to time, and become matted together, and being detained by the numerous papillæ, with which the surface of the leaves is covered, produces, at length, a morbid condition of the fourth stomach, and often of the bowels also. The most common symptom of this state of the digestive organs, is named the *yellows*, from the milk in one of the quarters of the udder becoming of a yellow colour, and stringy, as it is termed, that is, mixed with small filamentous coagula, or curds, often offensive in smell and taste, and sometimes streaked with blood. The acrimony of the milk causes a swelling and hardening of the quarter; and unless it is drawn off several times a day, it often so inflames the cellular texture of the udder, as to terminate in suppuration, and an obliteration of the receptacle, or quarter, as it is commonly named. The opening drench never fails of curing this disorder, if given in season, and one dose is sufficient; after taking it the animal must be kept at grass, as that food, and the exercise used in obtaining it, is essential to her recovery. In higher degrees of this disorder, where the cow ceases to ruminate, or chew the cud, where the appetite goes off, and the milk is almost entirely lost in all the quarters, the drench should be assisted by whey,

as directed in the treatment of red water; and when scouring succeeds, the cordial astringent drench must be given, as directed in the treatment of scouring or scantering. The swollen udder requires only the application of sweet oil, or foot oil. When cattle are turned suddenly into good pasture, they sometimes fill the rumen or paunch, so hastily, and so distend it, that it is rendered incapable of returning the food to the mouth for rumination. Fermentation then takes place, by which much air is generated, and the distention soon becomes such as to suffocate the animal, unless relief is afforded by introducing the instrument named a probang, and letting out the confined air. As soon as this has been done the opening drench must be given, and the animal turned into a bare pasture, where she must be for some time attended, and have the fermenting food removed from the mouth as it is thrown up; without this precaution it may be ruminated, and again swallowed, and the third and fourth stomachs so filled with it, as to produce the flatulent cholic, and a fatal inflammation of the stomach and bowels, from excessive distention by the air, which would be generated, for in those cavities, air could not escape readily upwards in consequence of their valvular structure. Should this fresh disorder, through negligence, be permitted to happen, the opening drench is still the best remedy that can be employed. Another method is sometimes made use

of for relieving an animal in this disorder, which is commonly named *hoven*, *blown*, or *blasted*, that is, a sharp knife is plunged through the left side into the distended rumen, or first stomach. The part where it is most prominent is chosen, namely, between the last rib and the hip bone; and always on the left side. The air being thus completely let out, the wound is closed by a pitch plaster, and the animal turned into a bare pasture, where it may get plenty of exercise and little food; that is, after the fermenting food has been removed from the mouth as before described. This method, however, is sometimes eventually injurious, and must be superseded by that of introducing a probang, and letting out the confined air by the mouth,—a method first proposed by Doctor Munroe. The wound in the rumen, as it heals, always adheres to the side, and thus a regular contraction of the cavity is ever afterwards prevented, and rumination thereby rendered difficult and imperfect.* Sometimes when an animal is turned into good grass, especially about the month of August and September, when the grass is high and abundant, from having been well watered, they eat a great deal during both the day and

* I have lately been informed that hoven or blasted cattle have been quickly relieved by giving four ounces of carbonate of soda, half a pint of castor oil, and a pint of water. The person who gave me this information, says, he has never known this fail.

the night, but not so much as to hinder rumination. Thus they gradually fill all the stomachs, and towards morning become so oppressed, that they lie down on the cold grass, which is, perhaps, wet, or covered with hoar frost. Digestion is thus put a stop to, and the animal often suffocated by the excessive distention of the stomachs. In this disorder, which is commonly called fog sickness, the probang must be introduced, and the opening drench given. The animal must then be made to move, if possible, and the food that is thrown up into the mouth must be removed. Here, also, a bare pasture is necessary afterwards; no other medicine is required; but a free access to water is necessary to soften and carry off the accumulated food, and when this has been accomplished, the cordial astringent drench may be necessary, morning and evening, for two or three days, to restore the tone of the injured stomachs and bowels. It is probable, however, that this would be more effectually, though more slowly accomplished, by keeping the animal in a bare pasture. Sometimes when an animal is kept in rich pasture during the month of June, the appetite is powerful, and the digestion quick and perfect, and thus, in a short time, so much rich blood is formed as to exceed the capacity of the blood vessels, and then inflammation is produced in some vital organ, and nothing but the most copious depletion of the blood vessels will save the animal's

life. The lungs are the part most likely to suffer, and next, the brain and the kidneys; producing mad staggers, or the inflammatory red water; and in steers or heifers, or in yearlings, the quarter ill is thus produced. In all cases of internal inflammation the animal appears stupid and heavy; the breathing is disturbed; the nose and upper lip hot and dry; the horns hot, especially at the roots, and the vessels of the eye distended. The pulse rises to above 100, and the appetite is usually lost. All these symptoms quickly increase, and unless the animal is properly treated, terminate fatally. Bleeding is the essential remedy, and must be performed as early as possible. The quantity of blood drawn should not be regarded, but the effect which is produced by it, that is, faintness: this gradually ceases, and after a few hours he appears relieved and cheerful, and often desirous of food. But this must be given cautiously; the barest pasture is the best place for him; but he may be allowed now and then a quart or two of fresh whey, which will serve to unload the stomachs and bowels. This remedy (bleeding to faintness,) always succeeds perfectly if employed in season, and followed by a suitable diet. In the month of September and October scouring often takes place, especially in animals predisposed to the disorder by hereditary weakness, frequent calving, weakness of the stomachs and bowels, gradually induced from several

winters' feeding on bad hay. Animals that have been taken from their native soil and climate, are also subject to this disorder, as well as remarkably good milkers, and this is the period when scouring generally commences. In this case the cordial astringent drench must be given every morning and evening, as directed in the Compendium, but must always be preceded by the opening drench, at whatever period the disease may occur. This remedy, I have reason to believe, will always succeed, if employed in season, and if the time of the year will admit of the animal being kept at grass. In very cold and wet weather, when shelter bscomes necessary, intervals of fine weather must be taken advantage of, for some grass and some exercise are essential to recovery; and when grass is deficient, either in quantity or quality, the best food is *good* hay, in moderate quantity, and mashes of *good fresh* bran with a little ground malt. A handful of wheat flour also may be stirred into each pail of water. In this way the animal may be restored and strengthened; and when grass becomes nourishing, and the weather favourable, the green fields will effectually recover her.* These are all the internal dis-

* I have lately been informed that many scouring cows have been cured by giving twice or once a day a drench made by boiling three or four sheets of large common writing paper in three pints of skimmed milk, until reduced to a pulp. One pint of this is a dose; and my corres-

orders of cattle, except the contagious epidemic, named murrain, or pest, and the epidemic catarrh, named distemper, or influenza. These are inflammatory disorders of the highest degree, and if curable, as the latter always is, can be cured only by the most copious and early bleeding. An absurd apprehension of fatal debility, and of the putrid nature of the disorder, must never prevent this remedy from being employed with boldness; nor should the animal ever be taken from grass, and the open fields, as is often done in the epidemic catarrh. Contagion, however, must always be guarded against with the utmost care. Tonics and stimulants are poisons in those disorders, and bleeding and grass are the only remedies ever required.—I have now endeavoured to give a simple, but comprehensive view of the internal disorders of cattle, and such as may lead to their prevention. I indulge a hope that the proprietors of cattle may be led by this, and the other essays I have written, to reflect upon the subject, and give a fair trial to the curative and preventive measures I have proposed. It should be recollected, however, that the success of the remedies I have suggested can be insured only by any early and careful application. Disorders are often neglected until they become incurable,

pondent adds, that he has never known it fail. The cow is fed on the sweetest hay, and turned out for exercise when the weather is fine.

and then the most absurd and expensive drenches are frequently had recourse to. In Downing's book on cattle medicine, a pint of port wine and a quart of strong beer are prescribed for one dose, as a vehicle for grains of paradise and other drugs; and in another receipt a quart of port wine is prescribed for one dose. Sometimes a choice is offered the reader between beer and urine, as if their properties were similar. The cordial astringent drench, including the beer, will cost about four-pence; the opening drench is more expensive, and costs from a shilling to eighteen pence. But one is always sufficient. The strong cordials given to cattle, or even the beer in which they are given, which is seldom less than a quart, may afford relief in some disorders, but they certainly weaken the stomach, and thereby increase the tendency to disease. The weaker the cordial the better, provided it be strong enough to produce the desired effect, and then it may be so repeated as, with due attention to diet, to render that effect more durable, and even permanent. In scouring cattle I have not yet known the cordial astringent fail. Proprietors would find great advantage in directing the medical treatment of their stock themselves, and still more were they to attend carefully to preventive measures. Were the practice to become general of making hay in the early part of June, when the grass is in flower, it would go a great way in preventing

the diseases of horses and cattle. In the former animal the only other conditions required for the preservation of health would be to give such hay with moderation, to work him *fairly*, and afford him such treatment as he has a just claim to, for all his disorders are occasioned by hard work, by excessive exertion, and by feeding upon hay. The crop, when cut early, may be less in quantity, but this is abundantly compensated for by its superior quality, and the after grass would be infinitely better.

ESSAY VIII.

ON THE DISEASE TERMED MINDERING.

In the last paper I had the honour to send to the Bath Agricultural Society, I thought I had described all the disorders of cattle, with the means of preventing and curing them. This, however, was a mistake; for a very serious disease has at times occurred in the vicinity of Mendip, and in those parts where the lead mines are worked, which has proved very destructive, not only to cattle, but also to horses, to dogs, and even to poultry. This disorder is termed *mindering* by the inhabitants, and animals so affected are said to be *mindered*. I have been informed by a respectable farmer of Wookey, who appears to be well acquainted with the disorder, that he has never known sheep affected by it. After heavy rains, the brook which runs through the meadows of Wookey, overflows its banks, and covers some of the adjacent lands, and these, after the water has retired, have their grass so impregnated with lead, as to be rendered poisonous; and it has been observed, that those animals who feed close to the stream, or pick up the long grass on the

margin of the water, are most quickly affected: it is said, that the water also is poisonous. It seems probable, that the poison consists of the carbonate of lead, which is sublimed in immense quantities in smelting the ore, and is carried through the atmosphere to a considerable distance, and deposited very extensively on the surface of the hill. During a heavy rain, this carbonate of lead is washed down in great quantities into the meadows, and the brooks, and gradually subsiding, imparts that poisonous quality to the grass that has done so much injury. A dog has been known to be *mindered*, after picking a bone in a meadow that had been thus poisoned. So far does the injurious effects of the lead mines extend, that the meadows near Wookey hole have been thus poisoned, though the nearest mine from which the metal could have been derived, was situated near Priddy, a distance, I believe, of several miles. The disorder sometimes occurs on different parts of the hill, and especially near the smelting places; from which it has been thought that the deleterious matter consists of the lead ore itself, in a state of fine powder. But it is known to impart a sweet taste to the grass, which the lead ore, however finely powdered, has not the power of doing; it must, therefore, I think, be a carbonate of lead, or some saline compound; but how the latter can be formed, it may be difficult to explain. If the lead ore contains sulphur, then a

sulphate of lead may be sublimed, and diffused to some distance, but I think it more probable that it consists of a light powdery oxide of lead, or a carbonate or super-carbonate. Sometimes the disorder has occurred close to the smelting places. One farmer, the proprietor of a mine, lost fifteen head of cattle by it, that broke down a fence round the smelting place one night, and eat freely of the grass round the banks. An intelligent and respectable farmer, of Wookey hole, also lost eight head of cattle at one time, in consequence of his meadows having been overflowed. This farmer, Mr. Baker, is the same whose sheep I was the means of preserving last summer.

The symptoms of *mindering* take place in different degrees, according to the quantity of poison that has been eaten. Nine of the fifteen head of cattle before mentioned, that were lost by one farmer, died within a week after the attack; the others lived longer. Sometimes they go on many weeks with the disorder, and sometimes even months; but it almost always eventually proves fatal. The most urgent and formidable symptom of the disorder is great difficulty of breathing, and such loud wheezing, as may be heard at some distance. So great is the difficulty of breathing in some cases, that the animal falls down and froths at the mouth, and appears to be near suffocation, which sometimes happens. More commonly the attack is less violent

and though the difficulty of breathing and wheezing are considerable, he continues on his legs, but appears in danger of suffocation. Thus he goes on for several days, or a week, perhaps longer, and then dies apparently from inflammation of the lungs. Sometimes the disease assumes a different appearance, is gradual in its attack, and takes the form of epilepsy. The animal is attacked with fits, which gradually become more frequent and of longer duration. He loses his appetite; becomes obstinately costive; the discharge of urine diminishes, and at length ceases altogether: thus he gradually pines away and dies in a wretched condition. Thus the disorder, named mindering, attacks in different degrees and somewhat different forms, and this variety seems to depend upon the manner in which the poison is received. When a large quantity of this oxide or carbonate of lead has been deposited on the grass, the animal takes in a considerable dose at once; and such an impression is made on the nerves of the stomach, as prevents for a time the absorption of the poison, and so affects those muscles of the larynx by which the rima glottidis is kept open, as to paralyze them in a certain degree; this explains the loud and violent wheezing, as well as the difficulty of breathing that takes place. This effect is sometimes so considerable as to cause suffocation in a short time: at others, the quantity of lead taken into the stomach being

smaller, the effect is not so considerable; but the difficulty of breathing, though not so great as to cause suffocation, and destroy the animal in a short time, is such as to cause an effusion of bloody water into the chest, the pericardium, and the ventricles of the brain, and in that manner produce a fatal disorder. When a very small quantity only of the poisonous oxide has been deposited, and only a small portion is taken into the stomach, the effect is somewhat different. In this case, the lead is gradually absorbed by the lacteals, and conveyed into the circulation. The impression made on the stomach is inconsiderable, and the symptoms have not at first a formidable appearance; but such is the nature of this poison when mixed with the blood, that though often slow in its operation, it is always ultimately fatal in its effect; for it is not expelled like the other metallic oxides, such as mercury, by bringing on an increased action of the vascular system, but paralizes all the emunctories, and even the heart itself. The principal symptom produced in this case, is epilepsy, or fits, with which the animal may be affected from time to time, and go on gradually declining for many weeks, or even two or three months; but the fits at length become more frequent and violent, and the animal dies in a wretched condition. From the information I have collected, and especially from the favourable termination of two cases, in which I have

reason to believe the efficient ingredient in the drenches employed was salt, I think it probable that the disorders may be cured by giving the animal as early as possible a solution of four ounces of common salt in a quart of water, and repeating it every fourth hour, until the poisoned food is completely expelled from the stomach and bowels. The effect of the salt may be promoted perhaps by clysters of salt and water; and whenever the symptoms will admit of it, the animal should be kept constantly in motion. In cases where the lead is swallowed in small quantity, and so slowly as to be absorbed by the lacteals, and impregnate the blood, there is no chance, I think, of cure. There are no means known by which this poison can be expelled from the blood, when once it is thoroughly impregnated with it. I have now given the best account I have been able to collect of this fatal disorder, which would have been more satisfactory to myself, had it been the result of my own observation and experienc

INSTRUCTIONS TO DAIRYMEN,

FOR THE

MANAGEMENT OF MILCH COWS.

BY

MESSRS. CHABERT AND HUZARD,

MEMBERS OF THE FRENCH NATIONAL INSTITUTE, OF THE AGRICULTURAL SOCIETY OF THE DEPARTMENT OF THE SEINE, AND PROFESSORS OF THE FRENCH NATIONAL VETERINARY ESTABLISHMENT.

TRANSLATED FROM

THE THIRD EDITION OF THE FRENCH,

WITH OCCASIONAL REMARKS,

BY JAMES WHITE,

VETERINARY SURGEON.

ADVERTISEMENT.

THESE Instructions, first digested by Professor Chabert, were printed at the royal press, in 1785, in 31 pages, 8vo. at the expense of the government, for the purpose of being distributed to some poor farmers in the district of Paris. Though it was drawn up perhaps rather hastily, extracts and copies of it were soon published in the agricultural works that came out. The Count de' Bonsi, known in Italy by several good works on the veterinary art, condescended to translate it into Italian, and added to it some notes. This translation appeared at Rimini, in 1788, in 20 pages, 8vo. The work soon circulated extensively, for it was seen that the management recommended was as applicable to other districts as to that of Paris; another impression therefore was soon called for. The second edition was considerably enlarged and improved, and was rendered more interesting by the addition of the Count de' Bonsi's notes; and this edition was more favourably received than the first. Count Balbi, Ambassador to the King of Sardinia, who was then at Paris, thinking it would prove very useful to

the farmers of Piedmont, sent it to Dr. Buniva, Member of the Agricultural Society of Turin, who engaged M. Modesto Paralotti to translate it again into Italian, and to add such notes as would render its application more general. M. Buniva, himself, added to it an extensive table, showing the best method of managing the breeding of cattle in Piedmont. This translation, dedicated to the Turin Agricultural Society, appeared in 1798, in 4to. in 48 pages, and the table, with a neat vignette, representing a milch cow in a meadow. The intention of this work (says the translator), is to point out the best method of preserving and breeding an animal which, in consequence of epizootic diseases, the immense consumption of beef, and the peculiar habits of the cow, is destroyed in great numbers daily. It contains a set of simple rules or instructions, easy to be followed, suited to the capacities and circumstances of the farmer, and sanctioned by eminent and experienced veterinarians.

Paris, July, 25, 1807.

INSTRUCTIONS

FOR

MANAGING MILCH COWS.

The profits of a dairy depend chiefly upon the diligence and knowledge of the dairyman or farmer; this is a truth, which has been established by experience at all times, and in all countries.

The circumstances chiefly to be attended to, are the proper quality and quantity of food, and of water; the dressing or cleaning the cows (as we do horses. *Translator*); the general management of the stables, or cow-houses: the proper treatment of them from the time of conception to that of quickening, and likewise the necessary attention from that period till calving; the manner of rearing the calf; and a careful observation of their disorders, as well as of the diseases of the cows.

Of the Care or Management required when Cows are first taken into a Dairy.

Cows that are brought from a distant country, require particular care and attention, until seasoned, or sufficiently accustomed to the cli-

mate, soil, food, and other circumstances of their new residence. By neglecting such precaution much loss is often sustained. M. Nota, a veterinary surgeon of Piedmont, has observed, that the cows of Savoy and Switzerland, when brought into Piedmont, are subject to very serious maladies; among others, red water, which he attributes to the weakness induced by change of climate and fatigue of travelling. Many of the latter cows, notwithstanding they were supplied with excellent fodder and white water (bran-water), became so thin, that they were nearly in a marasmus or consumption, and nothing appeared to do them any good.

The greater number of cows are purchased in the different markets; they generally arrive fatigued by travelling, and are often near the time of calving. They should be allowed a large quantity of litter, and taken out of the stable several times a day to have a little fresh air. They should also be well rubbed and brushed all over the body, but especially about the legs and joints if they appear much fatigued, and the legs should be rolled in bandages kept wet with warm water, with a little vinegar in it.

They should not be put suddenly upon the ordinary diet. At first they should have such food as is most easy of digestion, and it will be better if cooked. It should be given them in small quantities and frequently. They should have water rather warm, with a little bran or

meal squeezed into it, or a little salt. If they are near the time of calving, they should be bled to prevent abortion, which might otherwise happen from the fatigue of the journey. It will make their calving more easy, and less liable to be followed by unpleasant consequences.

The dealers in cattle are bound to give a warranty for a certain period after the sale, which varies in different places, but is generally nine days. The diseases which render a cow returnable are epilepsy, or megrims (haut mal), and scouring rot or consumption. This was fixed by a law of the 7th of September, 1765.

If the animal dies within the period of the warranty, the loss is the seller's, by a law of the 13th of July, 1699. The dealers in cows were put upon the same footing as those that supplied the Paris market with animals for slaughter. In short, according to article 1641 of the civil code, an action may be brought on a warranty for all diseases that were hidden at the time of sale and appear within the period of the warranty; such, for example, as any bad consequence from calving, if it has taken place previously to the sale, or when a cow has had her udder distended by keeping in the milk for a few days before she is brought to market, and this apparently good udder shall be found otherwise after the first milking or two.

If the cow falls sick or dies, or ceases to give

milk within the time of the warranty, the proprietor should appear before the proper authorities, and state the cause of the disease, of the death, or of the drying of the milk. The magistrate will then direct the cow to be examined by a veterinary surgeon, who will examine her, and give a certificate, which will enable the purchaser to recover from the seller, if any deception has been practised.

On Foddering or Feeding.

If it is of importance to feed cows liberally, and especially such as have been recently taken into the dairy, it is no less so to give them food of the best quality. It is an established fact, that a small quantity of fodder, well chosen and of prime quality, is infinitely better than an abundance of such as is bad or even indifferent.

The fodder of cows is of two kinds, viz. dry and green. The former is given in a stable, the latter in the fields, which is the method most conformable with the views of nature. In the former case, a small quantity only of food should be given at a time, but the more frequently. In this way we prevent cows from gorging themselves and suffering from indigestion, or from weakening the appetite, or from having a distaste for their food from having so much put before them, and blowing upon it for some time.

In eating only a small quantity at a time, they chew and grind it better, they ruminate better, and with more ease, whereby digestion is greatly facilitated; and not only the health and condition of the animal kept up, but an abundance of milk also, is the result of a perfect digestion.

There are very few plants that may not be thus given green in the stable. Those most commonly given are lucerne, trefoil, sainfoin, colewort, wild chicory, burnet. The leaves and roots of carrots, radish, rape, cabbage, pumpkin or pompion (les citrouilles), the leaves and tender twigs of maize or Turkey corn, lettuce, the leaves and stems of potatoes, and topinambour, and the tubercles of these plants, prickly broom, parsley, orach, bistort, vetches, lentils, pea and bean shells, in short, almost all leguminous plants, and the greater part of garden plants, as well as those which grow in the fields after the harvest, or in the fallows. Young thistles procure a rich creamy milk. The leaves and tender twigs of many kinds of trees, such as the acacia, elm, ash, maple, oak, melon, poplar; the leaves and tendrils of the vine, are aliments that may be employed with advantage.

On the borders of the sea, in times of drought and scarcity, cows may be fed with the different species of algæ and fuci, and *cristes marines*, after the plants have been bruised and boiled in fresh water. Buck-wheat and nettles

do well in the poorest land. Cows readily eat the latter, either when mixed with straw or steeped in hot water, for a night, and given in the morning altogether, the liquor being much relished by them:—they also produce a large quantity of milk.

When roots are given to cows, it is necessary to cut them in slices, as otherwise there is danger of their choking them, an accident that often happens. Mills are made for this purpose, which are simple, and not expensive.

Experience has shown that roots are more nourishing, and give more milk, when cooked or boiled, than when raw.*

* This method of feeding both cattle and horses has been practised for many years on a very large scale by Mr. Curwen, who says, in a letter to Mr. Peall, Veterinary Surgeon, dated Dec. 22, 1811. "I can confirm, after great and extensive experience, every thing I have formerly advanced with respect to feeding horses with potatoes. I have found it expedient to add a little more straw, with a view of rendering the food less costly. A decisive distinction should be made between cut straw and chaff or the husk of grain. The latter is perfectly indigestible and dangerous. I strongly suspect I have lost horses formerly by its being used contrary to my orders. The practice of potatoe feeding has been adopted by several gentlemen upon a large scale, all of whom concur in declaring that the opposition to relinquishing this mode of feeding would now be as great as it was to its adoption. I fed my horses till July this year, my stock was so great. I have found steamed straw very good food when I could do no better. You will observe, that the method I practice is

In England, Holland, Germany, Piedmont, and part of Italy, they give cooked food (by steam), and find great advantage in it. Great caution is necessary in giving the young shoots of oak, ash, elm, or other trees; either of these, when eaten to freely, are apt to bring on red water, dysenteric scouring, and other serious and even mortal diseases. Cows should never eat green fodder that has become hot by lying in a heap, not only because it is difficult of digestion, but likewise from its being liable to bring on inflammatory or putrid disorders.

that of boiling by steam. I feed 80 head of cattle, 40 milch cows, and the same number of oxen, with steamed chaff (cut straw) and some little hay; they are in very high condition, which I attribute to the warm food. The quantity of food used is but trifling. There are very few of my milch cows that are not fit for the butcher, at the same time, that the average of milk will be between 12 and 13 quarts upon 320 days. This plan of feeding is certainly making its way; and I do not complain, when I consider that it took Mr. Coke 12 years to establish the drilling of grain in Norfolk."

The Bishop of Killala writes as follows:

"In the winter of 1798, the period of scarcity, I fed my waggon horses upon steamed potatoes at my living in Lincolnshire; and notwithstanding the deplorable state of the fen roads, and the severe labour they underwent, they were in the highest condition possible, from the effects of the food." But some accident happening to the steaming apparatus, his lordship was reduced to the necessity of giving raw potatoes, and the consequence was, that they immediately fell away to a state that is hardly credible.

Green fodder should not be brought in or cut until the sun has dissipated the dew. It would be very dangerous to give it when covered with dew, as in that state it is difficult of digestion, and very apt to ferment in the rumen, or first stomach, and blow the animal, or blast him, as it is more commonly expressed; a disease that often proves fatal.*

* Both cows and sheep are very liable to be blasted when first turned into clover, or any of the artificial grasses. The degree in which they are liable to this accident depends, 1st, upon the state of the animal; if it be the first time, and he has a good appetite and a strong digestive power, he will eat with great avidity, and digest quickly for some time, but at length blood will be formed in excess, and the sensorium will be oppressed. The digestive power will then flag, but the appetite will continue, until the third stomach becomes distended, and incapable of perfoming its office. The first stomach, or rumen, will then be overloaded, and incapable of bringing up the food for rumination, in consequence of which it will ferment. The air which is generated by the fermentation will so distend or stretch the rumen as to prevent the descent of the diaphragm, and the influx of blood into the lungs, so that the animal is soon suffocated. It seems strange that the appetite for food should continue after the digestive function has ceased; and it may fairly be presumed, that it is a circumstance which would never happen, were we to follow nature in the management of animals more carefully than we do. In the natural pastures a cow would be incapable of gorging herself in this manner. The great variety of herbage which nature has provided for them induces them to move about in order to find the herbs most agreeable to their appetite, which probably varies, according to the state or

If there is no sun the grass should be spread out for a short time before it is given.

wants of the body. When an animal that has been thus kept, is turned into a field of artificial grass as it is termed, he is like a child in the shop of a confectioner, and eats much more than is proper. It has been remarked by an experienced and intelligent farmer, that if sheep are turned into a piece of clover, or vetches, when the wind is in the east, it is almost sure to blow them ; for then he says, *the leaf is withered and hangs down.* In this state, perhaps, it is tough and less easily chewed. He prefers turning them in when the grass is a little wet with dew or rain, and does not keep them at first more than eight or ten minutes ; they are then taken off for about half an hour, and put back again for about eight or ten minutes ; after another short interval, they are turned out for good. When he finds sheep blown, he horns down about a quart of water which sometimes relieves them, but many die before any thing can be done for them. Mr. John Lawrence advises farmers to keep a digesting place for cattle, that is, a piece of short grass, where they can find but little to eat, and use sufficient exercise in getting it. Into such a place they should be turned after feeding a sufficient time on the artificial grasses. The degree in which an animal is liable to be blasted when turned into the artificial grasses depends, secondly, upon the state of the grass. If it be young and tender, as it is when moistened with a mild rain or dew, it is easily chewed and digested, and passes through the stomachs and bowels readily; but if it be withered, it is tough, and not so easily chewed or thrown up for rumination, it lies closer or more compactly in the first stomach or rumen, and is then more liable to ferment. A knowledge of these circumstances should lead the farmer to adopt an effectual mode of prevention; and if those I have just noticed are objected to, they can cut the grass

The grasses or herbs should not be cut until the flowers begin to open ; before this period they are watery, and contain less nourishment; and after this period they beome more and more fibrous, stemmy, hard, tough, and indigestible. Moreover, when cut too early, they are apt to bring on a diarrhæa. When cows are put into a field, it should be after the dew has been dissipated. If the pasture is short, they may be left at liberty; but if it is abundant, and consists of artificial grasses, such as lucerne, vetches, clover, &c. the cows should be confined by a rope to a picket or post fixed in the field, where they are kept until they have eaten the grass, and for some time after, or until they have ruminated; they are then fixed in another spot. This change ought to take place five or

and feed them from cribs in some rough ground, or in a large yard or cow-house. The authors observe, that when the artificial grasses are in this manner, they should not be cut or brought in until the dew has been dissipated, or it would be liable to blast the animals. This position seems at first to be at variance with the opinion of the farmer before quoted ; but on reflection, it will not appear so; for an animal feeding in a field is in very different circumstances from one that is kept in a house. The latter would eat the grass when moist with dew with greater relish perhaps, and be therefore more apt to overload his stomach; and it seems to me that this precaution of the French professors would be but of little or no importance, if a proper quantity only of such grass were given at a time; for I cannot think that there is any injurious quality in the dew.—*Translator.*

six times a day; otherwise, or by allowing them a large space, and changing them only twice or three times a day, they would be apt to gorge themselves, or after satisfying their appetites will trample upon and spoil the remainder. Little and often is a maxim that ought never to be lost sight of in feeding milch cows. By this method they thrive better, and give more milk. In summer it is necessary to take cows from the pastures during the heat of the day; as the great heat and the stinging of flies cause a considerable shrinking of the milk. Cows should be turned into a field, or exercised in some way every day at all times of the year, unless the weather is very bad; during the time of exercise their stalls should be cleaned out, and fresh litter put in. When cows are kept on dry fodder, it is of great importance that it should be of good quality, and dispensed in proper quantity; unless these conditions be observed, all other attention will be but of little use.

Fodder that has been badly kept, that has been heated or become mouldy, or dusty, such as the sweepings of barns, which are scarcely better than the husks of grain mixed with dust, and are named *balot* or *baillot* (in France) contain but little nutriment, and are productive of many disorders.

The second or even the third crop of artificial grass, when of good quality, and cut and saved in a favourable time, appear to agree better with

cows than the first crop, of which the stems are stronger and more fibrous, more difficult of digestion, and produce less milk.*

All the green plants we have named as good food for cows, may also be given dry. Also the straw of barley and oats; the same may be given unthreshed; this, indeed, is infinitely better, more relishing, and more healthy,—wheat straw, when good and fresh, the siftings of rye, peas, beans, barley, especially when boiled; bran, chippings or raspings of bread, oil cake, hempseed, beech masts, starch dregs, grains, &c. Sometimes one or more of the above kinds of fodder are mixed with boiled roots; this is called *bouée* in most of the cantons. Cows do very well with these different kinds of foods when properly dispensed; that is, when given in

* It is commonly remarked by dairymen, that the young shoots of grass which spring up after hay harvest, especially when there has been some rain, are very productive of milk. It is the same with the first shoot of the grass in spring, or the early part of summer. At these periods, however, cattle appear to be most liable to inflammatory disorders, probably from an excess of blood. These tender shoots are eaten with avidity, and quickly digested, and then a more than ordinary quantity of blood must, of course, be formed. This superfluity of blood is generally carried off by an effort of nature, as is is termed; that is, a diarrhœa or scouring takes place, or bloody urine; but sometimes it falls upon a vital organ, especially the brain the heart, or the lungs, and the animal is destroyed from a want of early and sufficient bleeding.—*Translator*.

small quantities, and six times a day at least; if this cost some trouble, it is amply compensated for by the improved quality and increased quantity of the milk. Straw is made more palateable by mixing it with the skimmings or second crop of hay, which for this purpose should not be quite dry, but mixed with the straw by laying layer upon layer. tt will not be less palateable if sprinkled with water in which a little salt has been dissolved. It may be sprinkled at the time it is given, or a few hours before. This precaution is indispensable when cows are kept on dry fodder, as it induces them to drink a sufficient quantity of water.*

The dairyman acts in opposition to his own interest when he does not allow his cows sufficient nourishment, and if it is true that one cow properly fed will yield as much as two that are badly kept, it is no less injurious to give too much food: the cows in this case fatten, but give less milk, or become quite dry, and are always wanting the bull.

One essential thing to be observed in feeding cows is not to pass too suddenly from green to

* In two dairy farms, I endeavoured to ascertain the quantity of water each cow drank in the summer, when at liberty in the fields. In one of the farms it amounted to about 12 gallons in 24 hours; in the other to 18 gallons. It was on these farms that the advantage of giving cows pure water pumped into troughs was so clearly demonstrated.—*Translator.*

dry food, or the contrary; a sudden change of food diminishes the milk, but when the change is from green food to such as is less succulent, the shrinking of the milk is more considerable. A change of stable produces a similar effect. If the new stable is too cool or too hot, a temporary shrinking of the milk is caused by the change of temperature.

Of Water.

Cows should be watered twice a day, and in summer three times; this is the more necessary when they are kept on dry food. The neglect of this precaution is the chief cause of the inflammatory diseases to which they are so subject.

It is also necessary that the water which is given them should be pure and transparent; running water should be preferred; the best of all is that which has been agitated by passing through a mill, this appears to make it softer and more favourable to digestion. It is a dangerous prejudice to believe that muddy or stagnant water is better for cattle than that which is pure. The evils arising from this prejudice are occurring daily.*

* An experienced dairy farmer who keeps a large dairy farm has lately asserted that if it cost him 10 shillings a week to water from troughs into which good water is pumped, it would be more for his interest to do so than

The water of ponds surrounded with ash trees is often covered during the heat of summer with the cantharis fly, which the winds blows from the leaves of the trees. These insects when swallowed with the water are certainly poisonous. When no other than stagnant water can be procured, or such well water as is very hard and unfit for culinary purposes, or for washing, it should be agitated by throwing it many times from one vessel to another; or what is better, filtered through sand or gravel. For this purpose, a cask from which the head has been taken out is placed on a suitable situation, the bottom has many holes bored in it, it is then covered with cloth, and upon this five or six inches of sand is placed; the water strained through this filtering apparatus is directed, by a sort of funnel, into the trough from which the animals drink. Water is rendered much softer, and produces more milk by being *blanched* as it is termed; that is, by having a little bran or meal stirred into it. Blanched water must not be kept long, as it is apt to ferment and become sour. During the heat of summer, cows are apt to become costive when kept on dry food, in this case it is

suffer them to drink stagnant or pond water. It may be observed that cattle almost always void their excrement either in the pond or near it, immediately after drinking; and as there is generally a sloping road made to the pond, the dung that is near the pond must, in a great measure flow into it.

necessary to give them water in which bran and linseed have been boiled; and even if they are not costive it will be proper to add about a glass full of vinegar to each pailful of water when the water is of bad quality, or when the weather is very hot and dry.*

* I have observed, in chewing hay that is mow-burnt, that there is considerable acidity it it; such hay, when used with moderation, may not be injurious; but when no other can be had, and it appears to affect the health of the animal, and consequently the milk, the inconvenience may be obviated perhaps by sprinkling the hay with water in which salt has been dissolved, and mixing a little clay or chalk with the water they drink. Many fields abound with sorrel; the hay of such fields must, I think, have considerable acidity in it, but it does not appear to do any harm; on the contrary, I have been informed that cows give more milk from such pasture. Again, if we examine the flowers of clover, we find them to contain sugar, and it may fairly be presumed that the sugar is not lost when it is made into hay. Though sugar may be essentially necessary to the perfection of milk, it is probable that, as in most other things, it is possible to give too much of it; nor is it unlikely that a certain portion of acid is necessary also to the perfection of milk. It appears to me that the first thing to be sought for in the management of cows is a healthy digestion, for when the digestive function is imperfect, the product of it will be so likewise, however good the food may be, or in whatever manner it may be dispensed. Common salt seems to be the best stomachic for animals when given in small quantity, and probably it is one of the best means of improving the quality of bad fodder. I have just been informed that the greatest advantage has been experienced America from giving salt to cattle and to sheep. A tree

When cows become costive in hot and dry weather they should be supplied with roots that have been cooked by boiling, and broken or mixed up in the same water. Some roots should always be reserved for this occasion, if there are none, some barley oats or rye must be boiled instead of them, and broken up and mixed in the water. Some portion of this decoction must be mixed with the water which is given to the cows.

Of the necessity of dressing (cleaning, pansement) Cows.

It is an error to suppose that dressing by the hand with a brush and curry-comb is not as necessary for cows as for horses. A neglect of this attention is the source of many evils. Cows cannot be healthy unless the functions of the skin are duly performed; that is, unless the insensible perspiration goes on regularly; and this cannot be

is thrown down and *faced*, or made flat on its upper surface, on which suitable cavities or dishes are made with an adze. Into these a small quantity of salt is put daily, and it is uniformly found that they acquire an appetite for it in a short time. It is said to improve both the quantity and quality of the cows' milk, and to promote the fattening of sheep. It is a common practice to sprinkle even the best meadow hay with salt as it is put together, which in America is generally in large sheds, built for the purpose. This is the hay on which calves are fed when being reared, and with the best effect.—*Translator.*

when they are put into wet land, and no care is taken to remove the dirt or matter by which the perspirable vessels are obstructed. In dairies where the dressing of cows is regularly practised, they are uniformly stronger, and in better condition, are less subject to diseases, yield more milk, and that milk is of very superior quality. The cows should be dressed once a day, nor should any dung be left on their coats. This operation will not be found difficult when it is regularly practised, and plenty of fresh litter is allowed, and their dung often removed, or when they are prevented from lying down in it. Cows thus managed will be found much more profitable than otherwise; and the improvement will be observable both in the dung-heaps and in the milk.

It is generally believed, that if cows have sufficient food, it is all that is necessary; but we feel no hesitation in asserting that however well cows are fed, they will not be found profitable, or not so much so as they would be, if the care and attention we have recommended in all other respects were also given them; while those that are so taken care of will be found to thrive even upon indifferent food.

It is necessary to wash the udder and teats with warm water; we thereby prevent those hard swellings which are often so troublesome, also warts and other excrescences to which the udder is subject without this attention. The udder,

and especially the teats, should be washed immediately before the cow is milked.

Of the Stable or Cow House.

The most healthy stables are those which are open to the east, or have an eastern aspect and are built on a dry and elevated situation. They are generally too close; the common opinion that cold is injurious to cows, and that they cannot be too carefully guarded against it, is the most common cause of many of the disorders to which they are subject. Their stables, in general, are not only very low, and with narrow openings, but are also shut up as closely as possible if the weather happens to be a little cold; yet there is not, perhaps, a more pernicious or more fatal practice.

Experience has proved that cows may be kept in the open fields without shelter, without suffering any inconvenience from it, even in the coldest weather; it is better, no doubt, to keep them in a more comfortable situation, or in a stable, but the stable cannot be too open, however cold the air may be. It should be held as a general rule that a stable is too close when on entering it the breathing is affected, or there is any strong urinous smell. If it be of importance to keep stables open or well ventilated, it is no less so to keep them clean. When dung is left in them it renders the air unwholesome, and

is liable to bring on putrid disorders. When cows are kept in a stable they should not be too confined; we have seen stables where they had not room to lie down, unless it was one after another; yet each cow ought to be allowed a space of six square feet. It is a good plan to have a ventilator near the ground on the north side: this will be found the best method of renewing and cooling the air of the stable in the summer. It may be shut at pleasure, either by means of straw or otherwise. There should be a gutter behind the cows to carry off the urine and excrement, and convey them into a ditch on the outside of the stable. By these means, the animals and their habitations may always be kept clean. It is necessary also to keep pigs, rabbits, and fowls from the stable, as they make stables unwholesome. There are countries where the stables are so contiguous to the barn that the dust raised by thrashing and winnowing gets into them, and by being frequently breathed by the cows is liable to bring on peripneumony, or consumption. The instructions contained in this and the preceding article may appear rather problematical to the generality of farmers, or those who only keep cows for the sale of their milk; for they are persuaded, and daily observation appears to demonstrate to them, that the secretion of milk is more abundant in cows that are not exposed to cold air. They depart rom the principle laid down above, in shutting

up the stable, and depriving the animals of light and of air during a considerable part of the year. If, however, they place in their account against this supposed increase of produce the expense of purchasing new cows to replace those that have been, we may almost say, suffocated, they may be prevailed upon to abandon this pernicious practice, and suffer their cows to feel the comfort of light and wholesome air. But prejudiced people seldom calculate, and, if they do, the calculation is too often erroneous; it is only by a series of experiments often repeated and made public, that they will be persuaded to adopt the improvements that are proposed to them.

On the Management of Cows at the Time of Conception.

Cows that are not in calf are generally in heat every three weeks, at which time, and at the moment they are most in heat they should be put to the bull, as they will then conceive more readily. There are cows which continue in heat only a very short time; with such this attention is the more necessary. They are known to be in heat by the following signs. They are continually lowing and mounting each other, or upon the bull; they are restless, and often running about; there is also an elevation of the tail, a swelling of the genital parts, and a slight

discharge of white glairy matter. After they have taken the bull, they should be put away and not brought again to him unless they are again in heat. There are cows that never conceive, but continue to be in heat every three weeks; these are named *Taurellieres*. If cows that have missed are bled immediately before the bull leaps them, it will facilitate conception. It is seldom necessary to have recourse to this expedient a second time, and it will seldom succeed unless the animal is young. We have generally observed that weakly, flat-sided cows, or such as are disposed to consumptive complaints, are often in heat again after being bulled. Heifers should not be put to bull before they are two years old; they then get to a larger size, are more vigorous, and more likely to breed; if they are kept till three years old it is still better.*

Cows may be put to the bull every year. The rule with regard to milch cows is not to put them to the bull again until they cease to give any milk. Experience has proved that cows

* I think it likely that the breed of cows may be greatly improved by attention to this circumstance. Breeding is an important process in the animal economy, and when it takes place prematurely, or before the animal has arrived at a sufficient age, it tends in a considerable degree to exhaust the powers of the constitution, and thereby not only shorten the animal's life, but likewise lay a foundation for many disorders.—*Translator.*

which are kept without breeding for several years generally fall into a consumption.*

On the Management of Cows during Gestation.

The cow goes nine months with calf; some give milk during the whole time; others lose their milk about the seventh or eighth month. It is the best plan, however, in either case, to cease to milk them at seven months, unless the udder should swell, in this case only half the quantity in the udder should be drawn off, for the milk is of little value, and may be necessary to the nourishment of the fœtus. Cows that are with calf should be kept in fields where the

* It has been observed that cows which are bred from only once in two years have calves with stronger constitutions, and which, as they grow up, greatly exceed the calves of such cows as are bred from annually. By this method, we may obtain from a cow of ordinary size and form calves of a good size, and, by pursuing this system, we may probably obtain stock of very superior size and form.—*Authors.*

It appears to me that it is of more importance to keep the animal from breeding until she has arrived at maturity, than to breed from her only once in two years. The object in both cases is not only the improvement of the breed, but making the most of the animal. That either of these circumstances would prove advantageous to the farmer can scarcely be doubted, for all the instructions given by the authors appear to be the result of experience. But which of them would be found most profitable, or whether both of them may be practised, is a point that does not appear to have been ascertained.—*Translator.*

ground is nearly level, and where there are no large ditches; as abortion is often a consequence of their leaping over ditches, or slipping on very hilly or steep ground when driven into the stable at the time the fields are laid up, or in situations where it is necessary to employ dogs to keep them. Pregnant cows, and especially such as are near calving, ought to be fed better and with more substantial food than ordinary. Grain of any kind answers well, such as a few handfuls of barley or oats, or some unthrashed barley or oats. Some *good* soft fragrant hay of the second crop, or skimmings, should also be reserved for this purpose.

When pregnant cows are kept together in the same pasture, they should be carefully watched; as they are apt to quarrel and hurt one another, and slip calf or warp from this cause. But the most common cause of abortion in cows, and the reason of their being more subject to it than any other domestic animal, is the want of exercise, the great size of the paunch, rumen, or first stomach, and the hardness of the third stomach. Abortion may be prevented therefore by giving cows sufficient exercise, and by feeding them, as we have before observed, with food that is easy of digestion, and that contains a good deal of nutriment in small bulk. Straw, chaff, and bad hay, afford but little nourishment, load the stomachs and bowels, and impede the gradual growth of the calf in the womb. When

the calf has acquired a certain size, the pressure of the loaded stomach causes its death, and sometimes that of the mother also.*

On the Management of Cows at the Time of Calving.

The approach of calving is known by their bellowing, the enlargement of the udder, the restlessness of the animal, the falling of the flank and croup. The cow should then be constantly watched, that she may have assistance, if necessary, at the time of calving. The most common manner in which the calf comes forth from the womb, or the natural presentation as it is termed, is with the head and two fore-feet foremost. From the causes before noticed, however, this natural presentation is often changed; sometimes the hind legs and tail present; in either of these cases the calving may take place without assistance. If only a single leg presents itself, or the head only, or any other single part,

* The distention of the stomach with improper food, especially straw and bad hay, is, I believe, the most common cause of abortion, as well as of the frequent occurrence of difficult labour in cows. The other causes are unwholesome water, fog grass, or the coarse tough grass in wet situations. Too much exposure to cold and wet, and fighting with each other, or leaping over ditches. In the sixth volume of Instructions and Observations on the Management of Domestic Animals, there is an excellent treatise on this subject.—*Translator.*

the cow should not be left to herself to make fruitless effors to expel the calf, but the veterinary surgeon should be immediately called in to give the necessary assistance. There should never be too much haste in affording manual assistance for the delivery, as there is often mischief done by violent and ill-timed interference. We have even seen horses employed to draw out the calf by means of cords, without any regard to the efforts of nature or labour pains, which are generally sufficient for the expulsion of the calf when the presentation is natural. This violent kind of practice often proves fatal to the cow, or causes a prolapsus or falling down of the womb, and is infallibly fatal to the calf. When the calf bladder appears, it should be sufficient to break it and let the water to flow out of its own accord, and then the only assistance proper is to draw the calf gently at those times that the labour pains are observed. It is of importance also to abstain from heating drenches, such as wine with sugar and nutmeg, which are often given to hasten the discharge of the afterbirth, but which rather retard it by the irritation they excite; such drenches should only be given when the animal appears much enfeebled, and then only by the advice of a competent judge.

If the labour is tedious and continues for some time, we should be satisfied with small quantities of nourishing food, such as oatmeal gruel, warm, and a little salted. There should

always be an ample allowance of litter that the calf may not hurt himself in falling, for cows almost always calve standing. Calving often happens in winter, it is then necessary to cover the cow, and not let her go out for some days, and especially not to expose her to cold and rain.

The good condition of cows during the time they are with calf may generally be considered a presage of a fortunate delivery; it also indicates good management on the part of the proprietor, and renders particular assistance seldom necessary. Immediately after calving it is sufficient to offer the cow a little warm water, in which a few handsful of meal have been stirred; when the animal's thirst is considerable, which is often the case, a little more of this gruel should be given in half an hour, and repeated from time to time, taking care not to load the stomach.

On the Management of Cows after Calving.

It is a common practice, as soon as cows are delivered, and the umbilical cord or navel-string is broken, to attach a small weight to it in order to prevent its return into the womb. Though this is seldom necessary, it may, nevertheless, sometimes facilitate the expulsion of the afterbirth, and prevents its being retained too long. It may therefore be done, especially in feeble

cows, which, when exhausted by calving, make but weak efforts for the expulsion of the after-birth, or cleansings. The afterbirth, or placenta, is a large bladder or sac which encloses the calf in the womb to which it adheres by tubercles, named cotyledons (des rognons, des champignons, &c.) A quick expulsion of the afterbirth is not an essential condition of a good or natural calving. In general, when cows go their full time, and without accident, the after-birth comes off with scarcely any effort of the cow, in about from two to fifteen hours, more or less. These efforts are not always the same, they resemble, however, labour pains in some measure. They are weak at first, then gradually increase, becoming longer and more considerable; at last a more violent and prolonged effort than the preceding accomplishes the discharge, or cleansing, as it is termed; when the animal is in health, the cleansing should be left entirely to nature, and, on no account, should the hand be introduced in order to hasten the discharge. We have often waited until the tenth day without the least danger, not regarding the pressing solicitations of the proprietor to draw it off. It is sufficient to pull the umbilical cord which hangs out of the part, gently whenever there is a labour pain, but not to continue to draw it after the pain has ceased; and the force with which it is drawn should be proportioned to, or accord with, the effort which the animal makes; if it is too weak, it will be of no use, and if too violent, there is

danger of breaking the cord, and losing this resource for assisting nature in the discharge of the afterbirth, while, at the same time, it tends to weaken the cow. It is only when the animal appears ill and depressed, and when the natural efforts are evidently insufficient, that it becomes necessary to introduce the hand for the purpose of drawing off the afterbirth; but this must be done with great care, and should not be attempted except by an experienced person. There are drenches composed of urine, wine, with savin and rue, which are commonly given on this occasion (under the name of cleansing drenches), but we should be very cautious in the use of such drenches, as they may sometimes excite fever and inflammation of the uterus; there are but few cases in which they are required, nor should they ever be employed but when prescribed by a veterinary practitioner.*

* Since we have been appointed to the situation of official Veterinary Surgeons to the Tribunal of Commerce for the Department of the Seine, we have frequently seen inflammatory affections of the intestines and womb take place after calving, always in consequence of bad management. We do not know that any veterinary writer has hitherto described this complaint. It bears a striking resemblance to the puerperal fever of women, and, as in that malady, there is always an effusion in the abdomen. We shall give further information on this subject when we have received such communications as will enable us to establish just views of the disorder, for we presume that it would be easy to prevent it, and, e·haps, to cure it if properly treated.—*Authors.*

As to the rest of the treatment, gentle walking exercise when the weather is favourable, often repeated; and brushing the body, especially the loins and under the belly, with a whisp of hay or straw, or a piece of cloth, will promote the expulsion of the afterbirth. When cows are weak, or too long a time in cleansing, the only thing to be given is toast and weak wine, cider, or perry. When wine is preferred, it is to be mixed with an equal quantity of water. This toast should consist of five or six pints of wine and water, and about two pounds of bread toasted: they generally eat this freely. We have also given with success an infusion of two handfuls of camomile flowers in two quarts of water, to which may be added half a pint of wine, if there appears to be occasion for it; this drink may be given every two or three hours. Some hours after, half a pailful of warm water with a little meal or fine bran stirred into it. This blanched water, as it is termed, should be continued for five or six days, and if the cow appears very weak, and there is great difficulty in restoring her, the wine or cyder toast may be given for eight or ten days. It is necessary also in such cases to give some clysters daily of red wine and water, or of infusion of camomile. And some of the same liquor may be injected into the womb. These clysters and injections give that tone or strength to the uterus, and parts connected with it, which is required for the

expulsion of the afterbirth. It is of importance not to confound the weakness which depends on an exhaustion of vital power or strength with that which depends upon oppression only. In the former case, all the external parts are relaxed and cold; the eyes are pale, there is but little heat in the mouth and vagina, the muzzle is cold and moist, the pulse small and weak, the respiration slow; in this case, the strengthening plan before noticed is necessary; but in the second case, on the contrary, the air expired by the mouth and nostrils is hot, the eyes are red and rather fierce, the mouth hot, dry, and parched, the muzzle dry, the thirst is great, breathing very quick, the vagina red and inflamed, the skin dry and tight, the pulse hard and quick; this is a real inflammatory fever, which can only be subdued by bleeding, cooling drinks with nitre, acidulated drinks with honey, and by emollient clysters. These are the only means that can be employed under such circumstances to promote the discharge of the afterbirth. Many farmers leave the afterbirth to be eaten by the cow, as soon as it is discharged, under the erroneous persuasion that it makes the cow yield more milk; others, on the contrary, take great pains to prevent them from eating it, under a conviction that it is very injurious, and is apt to bring on consumption. If we consider the natural food and habits of the animal, we shall be convinced that neither of the opinions

are correct, but still it is the most prudent plan to take it away from them. The females of all animals, whether wild or domesticated, whether herbivorous or carnivorous, generally eat the afterbirth, and we have observed that cows that are not allowed to eat it, do not appear to suffer any inconvenience from the want of it.*

After calving, cows must not be brought suddenly to their ordinary mode of feeding, but gradually. When this precaution is neglected there is danger of indigestion and flatulent cholic, in a degree proportionate to the weakness of the animal. It should be laid down as a general rule to give cows that have lately calved only a small quantity of food at a time, but to choose the most nourishing, and that which is most easy of digestion. Cooked or boiled food in such cases is always the best. It sometimes happens towards the latter end of gestation, or immediately after calving, that the vagina comes out, and sometimes the womb follows it; this is generally caused by employing improper force in extracting the calf, or the afterbirth. It is necessary in this case to call in a person who has been accustomed to put back the parts; as it is an operation not easily performed by an inexperienced person. When the vagina only comes out, it will generally be sufficient to raise

* Count de' Bonsi has made the same observation in Italy.—*Authors.*

the hind part of the cow considerably by means of litter or otherwise, and keep the fore parts as low as they can be.*

There are cows which have a swelling of the udder after calving from an abundance of milk; it is necessary in such case, to draw off the milk gently several times a day, if the calf does not suck a sufficient quantity, and wash the udder with warm water, or with bran water, or a decoction of marshmallows. These means are generally sufficient, and there is no danger of their causing inflammation and abscess, diseases that require a considerable time for cure, and which are sometimes brought on by the application of butter, lard, or some rancid ointment; which are generally the applications made use of in such cases.

Sometimes pustules or sores break out in the udder, which are at first very painful, and render it difficult to milk the cows; nor is it an uncommon circumstance for the teats to become ulcerated, and nearly consumed, in consequence of the dung sticking to them. These ulcers require, after being washed with warm water, to have some soft cream applied to them, and when a crust has formed on them, a little fresh butter may be applied to get off the scabs.

* In the 6th volume of Instructions and Observations on the Diseases of Domestic Animals, part 2d, may be found a particular description of the method of putting back the uterus and vagina.

Some of the pustules contain a humour of a white or pearl colour, and are encircled by an areola or inflammation of the skin. This is what the English have named cow-pox, and the French vaccine. The matter of these pustules inoculated like the small pox, is a preservative from that disorder.

It sometimes happens that cows bear two calves, which they do not bring forth at the same time, but after some interval. After the first is born, it may be known that another is in the womb, by the cow being very restless or agitated, and being continually looking round to her flanks, and having labour pains, and appearing to pay little or no attention to the calf already born. When she continues in this state a considerable time, it is necessary to assist nature, by giving the animal a pint of warm wine (beer perhaps will do as well. *Translator*,) and by irritating the nostrils with tobacco so as to excite sneezing. If these means fail, the veterinary surgeon should be called in.*

* It has been remarked in England, that when a cow has two calves, it sometimes happens that one of them is a kind of monster, in which the two sexes are more or less apparent, and both imperfect. This new kind of hermaphrodite which we have examined, and one of which has been described by John Hunter, is called by the English free martin, and is reared with great care, being considered an useful animal for work. These have not been noticed in France, though without doubt the same phenomenon

On the Management of Calves.

It sometimes happens that cows neglect to lick their calves immediately after birth; in this case, it is necessary to sprinkle on them a little salt, rubbed up with crumb of bread or bran. There are calves which do not take the teat, unless they are brought to it and the teat put into their mouths; this must be done gently and with great care.

It is a prejudice very generally entertained, that the first milk is injurious to the calf, on account of its bad quality. This is contrary to the intentions of nature, which has provided at first a serous and yellowish milk that is named colostrum, of a laxative quality, in order to carry off from the stomach and bowels of the calf some injurious matter that has accumulated in them while in the womb. This matter is called meconium. It is necessary therefore that the calf should not be deprived of the first milk.

New-born calves are fearful of cold, and it is prudent to guard them from it; but it is necessary also to guard carefully against too much heat, or shutting them up in close hot stables.

Calves should not be weaned before they are two months old, or at least six weeks, whether male or female, when it is designed to rear them.

occurs here. We wish to call the attention of farmers and veterinarians to this curious subject. *Authors.*

For such calves, there is no food so good as milk; and if the mother does not yield a sufficient quantity, it is adviseable to let them suck from another cow as much as is sufficient, or bring them to drink it from the pail.*

It is an incontestible fact, that the longer a calf sucks, he not only grows larger and stronger, but acquires also a much better form and more robust health.†

Calves designed for the butcher may be weaned earlier, but they should not be killed before they are six weeks or two months old, as

* The usual method for bringing calves to drink from the pail, is to place the hand in the milk with the palm upwards and under the milk, while the fingers are raised above the surface of the milk for the calf to lay hold of with his mouth, which he does very readily, and sucks up the milk with great ease. *Translator*.

† Querbrat Calloet, who wrote on the subject more than a century ago, relates many examples in proof of this. Among other instances, he says, he has seen a farm where there was a number of large and small cattle, bred from the same cow and bull, and that all the large cattle had sucked longer than the others. He relates also having seen at Chartreux d'Auray, in Brittany, a large and handsome breed of cows that had sucked a long time, and their mothers were small. All depends upon this he says, and the profit is doubled by it. See A Method of Augmenting the Royal Revenues by several Millions, Paris, Lanlois, 1666, in 4to. p. 21, 22. See also what has already been said on the advantages of breeding a calf once in two years only, in the n e to p. 40.—*Authors*.

their flesh would not be so good or sufficiently firm for food.*

Calves which come early should be preferred for rearing. Those which come late, do not acquire sufficient stength to bear the cold of winter; they languish, and are reared with difficulty. Calves should not be weaned suddenly, but by little and little. The less they are able to eat, the more they should be allowed to suck; and when they are completely taken away, they should be fed with a little bran, and some of the soft fragrant hay of the second crop; they should have also a little milk and water, or water in which barley has been boiled and broken up. They may have also skimmed milk or butter milk; there is some difficulty at first in bringing them to drink; but they soon become accustomed to it. As to the manner of rearing them, it is of importance to allow good and sufficient provender, if we desire to have them handsome. It is a common practice to feed calves that have been weaned, only twice or three times a day; but this is not often enough: it is much better to give less at a time, and more frequently. As soon as they are fit to follow the mother, they should be let out; nothing does them more good

* The sale of calves before they are six weeks old is prohibited under pain of a penalty of 300 francs.

Letters Patent of the 1st of June, 1782, Art. 7. Ordonnance of Police of the 21 Nivose, Year 11, Att. 12.

Authors.

than exercise, and there is nothing, perhaps, more injurious than keeping them too long in a stable. Calves that acquire a habit of sucking themselves may be prevented by separating them from one another. They sometimes contract a habit of licking themselves, and swallowing the hair, which forms balls in their stomachs, and causes them to become thin and diseased. These habits cause them to lose flesh and become covered with lice; it subjects them also to worms, and to a disease similar to farcy. Calves cannot be kept too clean, or have fresh litter too often; for besides the evils already mentioned, if they are suffered to lie in their dung and urine, they are apt to become mangy, and scarcely ever thrive. They are subject to diarrhœa, which makes them thin, and which sometimes degenerates into a kind of dysentery which often terminates fatally. This disorder is generally cured by giving them several times a day eggs with the shells beaten up in milk, and continuing it until the scouring ceases. They should have also some clysters in which bran has been boiled. Should these means fail, one ounce of diascoridum electuary should be given every morning for a few days; and if the excrement is very fetid, the diascoridum should be given in a glass of good red wine, or a glass of elder-flower infusion, in which half a dram of crude sal ammoniac has been dissolved. Other calves, on the contrary, are not able to dung or void urine for

some days after birth; they soon cease to suck, are often stamping with their hind feet, are short-breathed, and generally die in a short time. This obstruction in the bowels and urinary passages is generally caused by not allowing them to suck the first milk, or when the mother is kept on dry food. Whenever this disease happens, the dung should be drawn out of the fundament with the finger, the finger being first oiled, and introduced carefully, and the hard excrement taken out gradually. When this has been done, one or two clysters should be thrown up, composed of infusion of mallows or camomile, and a little sweet oil.

On the ill Effects of Green Lucerne, and the Remedies for it.

Lucerne given green alone, without discretion, before the flowers open, covered with dew, or wet with rain, and not yet withered a little (fletrie) by the sun, is apt to give cows the gripes, and blast or blow them, a disorder which sometimes ends fatally. This plant, so far from being cooling, as some have imagined, is really very heating. It not only makes the milk of middling quality, but it is even certain, and farmers who are candid acknowledge it, that this milk, taken alone, is of a heating quality. It has also been observed by farmers, that when

pressed by a deficiency of other nutriment, or from economy, they are induced to keep their cows on green lucerne, and especially the second crop, and on no other food, they are subject to eruption, and an oozing of a yellowish or reddish fluid, which generally first appears on the pasterns of the hind leg, and spreads successively to the hocks, the thighs, the udder, and the belly. It does not often attack the fore legs. The skin chops, or is drawn up into folds, and exudes a sharp humour, which gradually dries, and forms yellowish crusts or scabs, which gradually fall off with the hair, and leave the skin naked. The thighs are so inflamed that the animal feels great difficulty in lying down.

This eruption causes so much weakness sometimes that the cows cut the inside of the leg with the opposite foot, and make themselves bleed; the appetite and milk diminish, but at the same time they ruminate, and do not appear in other respects ill: it is observed that they always drink more than other cows. This disorder is commonly named *jet de la luzerne, poussée d' herbe, rafle*. It continues about fifteen days, and terminates more quickly when the farmer does not apply butter, fat from the frying-pan, or other greasy matter to it, which is a common practise with them, The using these greasy and rancid applications leaves a swelling in the legs which is a considerable time in going off. The sooner the cause of the eruption, the lucerne, is taken

away from the cow, the more quickly does the disease cease; but the farmer has not always a sufficient quantity of other food to give them: he must then mix with the lucerne as much as he can of that fodder, whether green or dry, which he can procure; which should not be given till the day after it has been cut; during this time it should be spread out, and exposed to the sun. It will be useful also to sprinkle it with water in which some salt has been dissolved, immediately before it is given, and it should be given in smaller quantity than usual. In addition to these measures, they should be allowed white water to drink; that is, water with a little flour mixed up in it; the eruptions should be kept clean with warm water, or with an infusion of elder flowers: this, with walking exercise, pure air, good litter, and a strict attention to cleanliness, will soon subdue the disorder, which, though not of a very dangerous nature, is extremely disgusting, and cannot fail of giving those who see it a distaste for the milk.

Of the General Signs by which Illness is indicated in Cows.

These signs are weakness, dejection, hanging of the ears, dullness or winking of the eyes, ears and horns cold, though sometimes there is an unusual degree of heat in those parts; heat and dryness of the mouth, tongue, and muzzle; yellowness of the inside of the lips, of the eyes

of the inside of the ears, and of the skin in general; quickness of breathing, frequent bending the head, lowing or bellowing, frequent efforts to void urine, and high colour of the urine; the dung also being too hard, or too thin, too black, or too yellow, or mixed with blood. The suppression of the moisture or fluid that flows from the nostrils, the dryness and heat of the nostrils, the heat of the air that comes from the mouth and nostrils, the cough more or less hard, more or less difficult, the shrinking or drying up of the milk, ceasing to chew the cud, the coat being harsh, dry, and staring, and easily rubbed off, the dryness of the skin and its adhering to the bones, the tumours or swellings that sometimes appear suddenly, the trembling or continual agitation of the tail,—all the above signs are symptoms of some disorder, some of them of opposite natures; but as soon as any of them are observed, it is advisable to take away all solid food from the cow, and give only white water; that is, water made white by good bran or barley-meal, giving them plenty of fresh litter; and finally, to call in the veterinary surgeon or farrier, to supply any further assistance that may be required.*

* We cannot conclude these instructions without pointing out to those of our readers who wish to have a more detailed and extensive treatise on the subject of milk and all that relates to it, a work entitled, Precis d'Experiences et Observations sur les differentes Espèces de Lait; par A. Parmentier et N. Deyeux, Membres de l'Institut National de France. Strasbourg, chez F. G. Levrault; et Paris, chez Madame Huzard, An. 7, 8vo.

ORDER OF POLICE,

CONCERNING THE

ESTABLISHMENT OF DAIRIES,

IN THE

CITY OF PARIS.

Paris, 23, Prairial, An. 10 *of the Republic* (1801).

THE Counsellor of State, Prefect of Police, considering that the general establishment of Dairies in Paris is injurious, but that they might be permitted in some districts without inconvenience, orders as follows:—

1. There shall not be any dairy kept at Paris without special permission of the police.

2. All the dairy farmers of Paris are bound to provide themselves before the Prefect of Police within the month, with an account of the day of the publication of the present order.

3. That none, for the future, may establish a dairy in Paris without having first obtained permission.

4. Such measures will be taken with those who offend against this order as will not prevent them from following their business conformably to the rules and regulations applicable to the case.

5. The present order shall be printed, published, and posted.

The commissaries of police, officers of the peace, the commissaries of open and covered markets, the inspector general of health, and others appointed by the prefecture of Police, are charged each and whom it may concern to assist in its execution.

The general commandant of the first military division, the general commandant at arms de la place de Paris, and the commandant of the legion of picked gendarmerie and of the national gendarmerie of the department of the Seine are required to assist in enforcing these orders whenever it may be required.

(Signed.) DUBOIS,
Counsellor of State, Prefect and Secretary General.

Instructions for the Execution of the Order of Police of the 23d of Prairial. An. X. concerning the Dairies in Paris.

After the Order of the 23d Prairial, An. X. no dairy can be kept at Paris without special permission of the counsellor of state, prefect of police. But this permission cannot be obtained unless the dairy is conducted and the cows kept in the manner required. It is of great importance that the dairy, and every thing which re-

lates to it, should be conveniently situated and properly arranged, The rigorous execution of this measure is particularly necessary in Paris. If the dairy farmers of Paris had been compelled to adopt those measures sooner, there would not have been such nmuerous complaints as there now are against their establishments.

There is another precaution to be taken which is no less essential. The healthy state in which it is required that the dairies shall be carefully kept, is necessary to the health of the persons who attend, as well as that of the cattle; but the buildings commonly employed for dairies in Paris are by no means fit for the purpose. They are in general without any convenience for the distribution of the fodder, or the removal of the foul litter and dung. The stables are low, and so close that scarcely any air can get into them, which renders them damp and very unwholesome.

The greater part of the dairies are in the most close and populous situations, where the streets are narrow and the houses very high, There is no doubt that, under the present circumstances, the principal object is to preserve for the inhabitants of Paris the daily supplies which their dairies procure for them; but this consideration should not prevent us from removing the evils which accompany them. To accomplish this, there is no other expedient to be adopted than that of removing, as much as can be, the

dairies from the close narrow streets into the suburbs and open places. As this measure can only be carried into execution gradually, and after obtaining an exact knowledge of all the local circumstances connected with it, it is first necessary to take an account and a particular description of all the circumstances connected with it. This account should contain a description of the situation and state of each dairy,—of the size, the height, and means of ventilation in the stables; whether there are sufficient openings for renewing the air, if there are proper drains, and a paved court;—and whether the street is large and has proper drains for carrying off the urine of the cows. It is also necessary to observe that the dairy stables fit to be preserved, and those which may be established in future, should not be less than seven feet eight inches high; as to their length and breadth, they should be proportioned to the number of cows. A stable, for example, intended for four cows, should be at least 14 feet long.

To render the stables healthy, it is necessary that the floor should be higher than the adjoining yard, that it should be made to slope a little, and that they should be sufficiently large to allow of a free circulation of air; the window should be placed opposite to the door, in order to obtain a current of air. If the stable is separate, two windows will be more healthy than one. In stables of 24 feet two windows are indispensable,

and three in one of from 46 to 62 feet in length; or even more, according to circumstances.

The security of the public and the interest of the proprietors equally require that effectual precaution should be taken relative to the places where the fodder is kept. These depôts for fodder ought to be separated from the stables by a brick or stone wall when they immediately adjoin the stable, and by a brick or tile floor if they are over the stable. There should not be near or adjoining the depôt any hearth, chimney, stove, or furnace.

The commissaries of police, and those appointed by them to visit the existing dairy establishments, and the places designed for such establishments, will regulate their conduct by the preceding instructions. They will draw from them the principal bases of the reports they will have to make, and will carefully enter into all the details necessary to ground a decision upon.

Given at the Prefecture of Police, the 23d Prairial, An. X. of the French Republic.

(Signed) Dubois,

Counsellor of State, and Prefect of Police.

Police Order concerning the Sale of Milk.

Paris, 7 Pluvoise, An. XII. of the Republic.

The Counsellor of State, Prefect of Police, orders as follows:—

1. It is forbidden to keep milk in copper vessels that is kept for sale, under pain of a penalty of 300 francs.

2. It must not be exposed to sale unless of good quality, under a penalty of 200 francs.

3. The dealers in milk are bound to use measures duly marked and certified.

4. Such measures will be taken against those who act contrary to this order, as will prevent them from following their business,—comformably to the laws and regulations provided in such cases.

5. The present order shall be printed, published, and posted. The sub-prefects of the departments of St. Denis and de Seans, the mayors and their colleagues, the commissaries of police at Paris; the officers of the peace, the commissary of open and covered markets, the inspectors of weights and measures, and other persons of the prefecture, are charged each and whom it may concern, to assist in the execution of this order

The general in chief, governor of Paris, and the chiefs of the legion of picked gendarmerie, and of the national gendarmerie, are required to lend such a force as the occasion may require.

(Signed) DUBOIS,
Counsellor of State, Prefect.

(Signed) PIIS,
Counsellor of State, Prefect, Secretary General.

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THE END.

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